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DOCTORAL DISSERTATIONS

IN EDUCATION

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BY

MARY FEE, Oread Training School, University of Kansas.

REID HEMPHILL, Berea College, Berea, Kentucky.

J. MARC JANTZEN, College of the Pacific, Stockton, California.

L. AVERY FLEMING, Board of Christian Education, Church of the Brethern, Elgin, Illinois.

ETHEL DOUGLAS LOCK, Alfred Holbrook College, Manchester, Ohio.

E. THAYER GASTON, University of Kansas.

CLAUDE H. BROWN, Western Illinois State Teachers College, Macomb, Illinois.

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FUNCTIONAL GRAMMAR AND ITS RELATION TO CORRECT ENGLISH USAGE

Mary Fee

Introduction

Ever since the middle of the eighteenth century when English grammar was first included in the American school curriculum, the aims of its teaching and the important content for its instruction have been in dispute by those who have given the problem serious consideration and study.

In spite of its inadequacy for application to the comparatively uninflected English language, the Latin grammar of an almost purely inflectional language had a marked influence on the subject matter and method of teaching English grammar. Latin grammar was believed to be an important study not only as a means for learning the Latin language, but also because of its mental disciplinary value. Because of these facts, it was inferred that English grammar would also have similar values.

From the beginning, English grammar was highly organized, contained every known grammatical item, whether logical or useful, and it was taught as if it were a strict science and as if a knowledge of grammar were important for its own sake. The emphasis was placed upon classification, analysis, and parsing, with practically no motivation for applying the principles learned through speaking and writing, and little opportunity was given for the activities in which it was hoped to promote correctness and improvement. Grammar so organized and so taught is in this study referred to as formal grammar.

Introduced at the college level, formal grammar, taught by formal methods, progressed to the lower educational levels until it was strongly entrenched in the upper grades of the elementary school. It was not until the theory of mental discipline was to a great extent discredited by experimental research that teachers of English began to realize that they must seek other justification for teaching grammar. Experiments have shown that the teaching of formal grammar has little value for improving expression at the elementary school level.

Few teachers of English today believe that the teaching of formal grammar by formal methods to pupils at the elementary school level will guarantee improvement in expression. However, without doubt many present-day teachers of English do believe that a knowledge of certain grammatical items, selected because they are needed by pupils in order to understand why a sentence is or is not correct, may well be expected to function in pupils' expression, oral and written.

It may be that grammatical items have been and are being introduced before pupils are mentally mature enough to understand them or to need them in their speech and writing. It may be possible that only at a higher level than the elementary school are pupils mentally mature enough to

think in complex relationships and therefore ready to write complex sentences, ready to understand complex grammatical principles, and ready to make application of these rules to their own expression.

"On the basis of a fundamental belief and its corollary, namely, that growth in correctness and fluency of expression parallel to an extent the intellectual development of the child and that, consequently, that grammar which assists this growth should be cycled throughout the four (high-school) years, the author (Leonard) prepared a suggested experimental organization of the grammar to be taught during these years."[1]

As a result of her study of language development of children in grades four to twelve inclusive, LaBrant[2] concluded that the grammar of the sentence, if taught too early, is forgotten before the increased complexity of thought demands its application.

Frogner's[3] results from a study of sentence structure in the work of pupils in Grades VI, IX, and XI are in agreement with LaBrant's, concerning the increase in the use of the relative clause as a mark of maturity in writing.

The results of these and similar studies have caused teachers to become concerned with the selection and placement of grammatical principles which may function in the correction and improvement of expression.

In answer to the question, "What is the prime function of grammar?" Verna L. Newsome says, "The greatest contribution which grammar study can make is to the mastery of the sentence: to unfailing recognition of the sentence unit in speech and writing, and the power of building clear, vigorous, and varied sentences, and of interpreting their structure."[4]

To be sure, the possibility of function lies not only in the materials of instruction, but also in the method of instruction. There is, of course, always the question whether even those grammatical items listed by investigators as functional are so taught generally as to function optimally or at all.

Rivlin defines functional grammar, "as that application of the knowledge of a grammatical item which will prevent the commission of an error in English or which will assist in the correction of an error already made."[5]

Although practice has lagged far behind theory, since 1913 the trend has been toward teaching functional, as opposed to formal, grammar. In

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[1] Leonard, J. Paul, "Functional Grammar—What and Where," *English Journal* (H. S. edition), XXII (November, 1933), 730.

[2] LaBrant, Lou L., "A Study of Certain Language Developments of Children in Grades Four to Twelve Inclusive," *Genetic Psychology Monographs*, XIV (November, 1933), 387-392.

[3] Frogner, Ellen, "Problems of Sentence Structure in Pupils' Themes," *English Journal* (H. S. edition,) XXII (November, 1933).

[4] Newsome, Verna L. "Making English Grammar Function," *English Journal* (H. S. edition), XXIII (January, 1934), 48-57.

[5] Rivlin, Harry N., *Functional Grammar*, Teachers College Contribution to Education, No. 435. Columbia University, New York, 1930.

this period, the emphasis has been shifted from the study of grammar as a means of learning the mother tongue to the study of language through the sentence, with grammar introduced for improved corrections. Today, courses of study in secondary school English claim to present, and teachers of English profess to teach, those and only those items of grammar which will function in the improvement of speech and writing.

At the present time the value of "functional" grammar for improving English usage is questioned by those who have studied the matter carefully. Some evidences of conflicting opinions will be cited.

An Experience Curriculum in English[6] in the section called "Instrumental Grammar" states that "because scientific investigation has failed to show the effectiveness of grammar in the elimination of usage errors, it is not here organized for that purpose." It implies, however, two general objectives for the teaching of grammar: (1) to speak and write correct sentences, and (2) to build better sentences. Concerning the method of teaching the twenty-five grammatical items included there, it is proposed: (1) that the pupils shall be given exercises in imitating certain constructions which they need to use, and (2) that when through this imitation (guided by teacher interpretation and general discussion, perhaps) the grammatical concept emerges, the teacher shall give the pupils its proper name. Another section of the *Experience Curriculum* called, "An Elective Course in Grammar" presents a "systematic and logical grammar to those high-school seniors who presumably will enjoy and profit by it. This is not 'practical' or 'functional' grammar, not primarily 'prescriptive' grammar; it is grammar as a body of classified knowledge about language."

In a chapter of the Ninth Yearbook, Smith comments concerning the presentation of grammar in *Experience Curriculum in English:*

"Whatever may be our conviction concerning the relationship of grammatical knowledge to correctness and effectiveness of speech and writing, we can agree upon the fundamental principle of the proposed curriculum: that is, that we judge the success of our teaching in terms of the pupil's ability to use language and not upon his facility in ticketing tenses or naming parts of speech. Whoever believes implicitly in the power of grammatical knowledge to function in speech and writing will not quarrel with the proposal that it be tested in terms of its functioning. Whoever agrees with the *Experience Curriculum* that technicalities of grammar have no bearing upon correct usage will welcome the opportunity to test usage alone."[7]

The following statement was made by Hatfield: "Both scientific experiments and our own observation leave us in doubt whether the ability to parse and analyze has any considerable effect upon speaking and writing.

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[6] *An Experience Curriculum in English:* A Report of a Commission of the National Council of the Teachers of English, W. W. Hatfield, Chairman. English Monograph, No. 4 (1935), National Council of Teachers of English.

[7] Smith, Dora V., "The Development of a Modern Program in English," Ninth Yearbook, Department of Supervisors and Directors of Instruction, N.E.A. 1936, p. 167.

An obvious conclusion would be that we should abandon grammar. But many of us *know* that we use grammar daily as a guide to correct construction in our own speech and especially in the revision of writing; and we *feel* that probably our grammatical concepts function subconsciously in our building of sentences. We are not ready to give up the attempt to put our pupils in possession of a useful tool." He believes that "the situation demands a method involving greater motivation, developing such an understanding of the organization of words in sentences as will guide usage and increase language power, and requiring less time than the traditional procedure."[8]

In *The English Journal* Rivlin stated: "The next question to be answered is whether the new grammar (functional grammar) does raise the pupils' habitual level of speech and writing. This question cannot be answered satisfactorily on the basis of present research, although most of the published reports suggest that functional grammar, especially when taught on an individual basis after a diagnostic testing program, ordinarily leads to a marked improvement in the pupil's skill in the mechanics of English composition."[9] However, these experiments do not prove that functional grammar as taught in the conventional school under typical classroom conditions raises the students' habitual level of expression.

In *Instruction in English* Smith[10] reports the results of studies concerned with the teaching of formal grammar and for the most part—formal grammar taught at the elementary school level. It was on the basis of these results that some authorities prominent in the field of secondary English concluded that the traditional aims for teaching grammar in the *high school*, including the one persistently found in present secondary school English courses of study, namely, "as an aid to correctness in speech and writing," are discredited. Concerning these studies, Dr. Smith makes the following statements:

"It is easy to pick flaws in most of these studies. One thing seems clear, however—the burden of proof rests with those who believe that a knowledge of technical grammar functions in speech and writing. Up to the present time, so far as the present writer can gather from evidence available in print, only opinion supports this contention."

Investigation and experimentation bearing on the problem of this study show the futility of teaching formal grammar for the purpose of mental discipline,[11] as an aid to literary interpretation,[12] as preparation for

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[8] Hatfield, W. W., "What Grammar and How," *The Illinois Teacher*, XXIV (March, 1936), 202.

[9] Rivlin, Harry N., "The Present Status of Research in Functional Grammar," *English Journal* (H. S. edition), XXVII (September, 1938), 590-7.

[10] Smith, Dora V., *Instruction in English*: Report of the National Survey of Secondary Schools, Bulletin No. 17 (1932; appeared February, 1933), Government Printing Office, Washington, D.C., p. 5.

[11] Briggs, Thomas H., "Formal English Grammar as Discipline," *Teachers College Record*, XIV (September, 1913), pp. 251-343.

[12] Hoyt, Franklin S., "The Place of Grammar in the Elementary Curriculum," *Teachers College Record*, VII (November, 1906), pp. 467-500.

the study of a foreign language,[13] [14] and as an aid to correct errors in sentences.[15] The results of a comparison of formal and functional methods of teaching grammar indicate in one instance equal effectiveness of the methods and in another instance a considerable advantage for the functional method.[16] [17] The results of one study show a high degree of correspondence between ability to recognize and recall functional grammatical principles and ability to correct errors in sentences.[18] One experiment at the college level indicates that the teaching of formal grammar is less effective in developing language techniques than is an extensive reading program.[19]

The Problem

This study attempted to answer the following questions:

1. Does a knowledge of "functional" grammatical principles function in correct English usage of high school students as measured by ability to recognize and correct errors in sentences and by accuracy in the free writing of letters and compositions?

2. What are the relationships of reading skill, general mental ability, and cultural background to: (a) a knowledge of "functional" grammatical principles? (b) the ability to recognize and correct errors in sentences? and (c) accuracy in the free writing of letters and compositions?

The Investigational Program

The data, on which the study was based, included the scores made by 292 tenth grade students of Topeka, Kansas, High School during the school year 1937-38 in the following testing program:

General Tests

1. Iowa Silent Reading Tests Advanced Test: Form A (Revised) For High Schools and Colleges
2. Kuhlmann-Anderson Test Grade IX—Maturity
3. Questionnaire

Initial Tests (Sept. 14-20, 1937)

4. Kirby Grammar Test, Form I
5. Informal Grammar Test
6. The writing of one composition
7. The writing of one letter

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[13] Barber, J. E., "Finds English Grammar of No Benefit to Pupils of a Foreign Language," *Nation's Schools*, XVII (January, 1936), p. 25.

[14] Rivlin, Harry N., "English Grammar as Preparation for a Modern Foreign Language," *English Journal* (H. S. edition), XXIII (March, 1934), pp. 202-7.

[15] Asker, William, "Does Knowledge of Formal Grammar Function?" *School and Society*, XVII (January 27, 1923), pp. 109-111.

[16] Crawford, C. C., and Royer, Madie M., "Oral Drill versus Grammar Study," *Elementary School Journal*, XXVI (October, 1935) pp. 116-119.

[17] Klopp, W. J. "Grammar by Rule or Practice," *English Journal* (H. S. edition), XX (February, 1931), pp. 155-7.

[18] Catherwood, Catharine, "Relationships Between a Knowledge of Rules and Ability to Correct Grammatical Errors," Master's thesis (unpublished), University of Minnesota, 1932.

[19] Clark, J. D., "A Four-year Study of Freshman English," *English Journal* (College edition), XXIV (May, 1935), pp. 403-10.

Final Tests (May 27-June 1, 1938)

8. Kirby Grammar Test, Form II
9. Informal Grammar Test
10. The writing of one composition
11. The writing of one letter

The reading and mental tests were used to study the influence of reading skill and mental ability upon knowledge of grammatical principles, ability to correct errors in sentences, and ability to use English correctly in free writing. The questionnaire was given for the purpose of determining the cultural background of the students. The grammar tests were necessary to compare the grammar knowledge of students with their ability to correct errors in sentences and with their ability to use English correctly in the free writing of letters and compositions.

The first two tests listed are well-known standard tests; the questionnaire, constructed by the writer, asked for information concerning matters which she hoped would reveal the student's general cultural background. The questions pertained to such environmental factors as: membership in elective English courses, selection of other school courses, grades failed or skipped, foreign languages studied, education of parents, amount of time per week spent in study, books most enjoyed during the preceding year, magazines and newspapers read, father's occupation, etc.

The two grammar tests, given at the beginning and again at the end of the investigational period, purported to measure the same thing; namely, ability to correct errors found in sentences and a knowledge of the grammatical principle involved in making each correction. The Informal Grammar Test is a three track test consisting of three parts: A, B, and C. Part A consists of twenty-six sentences, each of which contains one faulty usage which the student must recognize and correct. Test B consists of a blank page on which the students are asked to state their reasons for having made the corrections. When Part B has been completed, it is collected and the students are given Part C which contains thirteen grammatical principles, each one of which applies to two of the corrections made in the sentences. This part also contains two nonsense principles. The students are required to match the principles applicable to the corrections made. This test was originally devised by Catherwood[20] who used sentences from Charters' *Diagnostic Language and Grammar Test*[21] and The Chicago Tests for Mastery.[22] The sentences were restated whenever necessary so that each contains only one faulty usage although most of them contain a correct

[20] Catherwood, Catherine, "Relationships Between a Knowledge of Rules and Ability to Correct Grammatical Errors." Unpublished Master's thesis. University of Minnesota, 1932.

[21] Charters, W. W., *Diagnostic Language and Grammar Test*, verbs, Form I, Grades VII and XII, Public School Publishing Company, Bloomington, Illinois.

[22] Camenisch, Sophia, "Grammar and Usage, Ninth Grade Check-Up Test." Parts I, II, III, Chicago Practice Tests for Mastery, English Journal Publishing Company, 1926, Chicago, Illinois.

statement involving some other troublesome usage. All of the usages included rank high on Rivlin's[23] functional scale.

The make-up of the Kirby Grammar Test differs from Test A of the Informal Grammar Test in three distinct ways: (1) it tests a wider range of grammar information, (2) the rules are stated so that they apply to specific sentences; e.g., " 'May' should be used in requests when permission is desired," and (3) the errors in the sentences are located by a choice between two forms; e.g., "(Can-May) we try your new skates?" Of the grammatical items included in this test, 24 rank high on Rivlin's functional scale; 8 rank rather low, and for 11 there are no data given. The majority of grammatical items used in the two tests are those most generally believed, by teachers of secondary school English, to be "functional." It was desirable that every grammatical principle involved in the tests should rank high on Rivlin's scale of functional grammar, but the Kirby Grammar Test was the most suitable standardized test that the writer could find for the purposes of this study.

Both the letter and composition were written in the regular class periods under supervision so that the students must follow the directions exactly. The students were asked to write a social letter to a friend or relative, to complete it during one class period, to limit it to one page, and to write as well as possible. The students were permitted to use two class periods for the composition. On the first day they were asked to select a topic either from a list of suggested ones or otherwise, to organize the content, and to write rapidly a first draft. The papers were collected at the end of the period, and the next day the students revised, corrected, and copied the final draft.

Plan of Grammar Study

In the school where this investigation was made, the emphasis in teaching grammar at the tenth-grade level is on the "grammar of the sentence." Much practice is provided by means of printed sheets for developing recognition and improved correctness in the use of the sentence. Parts of speech are taught with special emphasis on their uses in the sentence. The differences between literate and illiterate and between colloquial and poor usages are taught. The English teachers in this system compiled in 1935 the *Tower Guide*, a handbook of the fundamentals of English, and although each teacher has freedom to teach what she believes her students most need, the handbook serves as a check and a guide to direct her. This handbook contains an outline of grammatical nomenclature on which the students are tested once each semester, and a grammar chart with which students are expected to become familiar in order to use it as reference. Each student is required to keep a notebook. A written theme of at least one page is required each week, and in this careful sentence structure is insisted upon. Besides the written themes there are also oral compositions.

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[23] Rivlin, H. N., op. cit., 145-152.

In addition to the grammar study the program in English is interspersed with a study of literature and reading.

The fourteen teachers of English who cooperated in this project are of outstanding ability and the department head with whom and under whose supervision they worked is prominent in the field of secondary school English—as a teacher, a writer, and a worker in the field of curriculum revision.

Scoring of the Tests

The tests were all scored by at least two people working independently. The standardized tests were scored by means of and according to the standard sets of directions and keys. The letters and compositions were analyzed for grammatical errors by checking against a list of the categories of grammatical principles used in the tests.

An analysis was made of the questionnaires by assigning an index number to each item so that comparisons could be made of contrasted groups. For example, the index numbers used to denote the quality of the magazines best liked by the students were those assigned by Wert[24] as a result of a study he made in 1935. The books read were listed with directions given for rating the quality. Three teachers of English rated them independently and an average of each three ratings was taken as an index number for the quality of that book. Some items, such as newspapers read, were given an index number of "1" for each item listed because the range did not exceed eight and they were all well-known metropolitan dailies, somewhat equal in quality. Information obtained from the mental and reading tests was used in this part of the study, expressed as scores for index data. The education of parents was recorded in years of school attendance, and the amount of foreign language study done by students was recorded by semesters.

The test scores were treated statistically and this involved such techniques as comparison of measures of central tendency, determining reliability of gains, intercorrelation, and partial correlation.

The method of contrasted groups was used to determine the influence of cultural background, mental ability, and reading skill upon correct usage in free writing. The criterion used for selecting the groups was the amount of correct usage found in both the initial and final letters and compositions. The 40 students who made the lowest percentage of grammatical errors for all the free writing are designated as the High Group, and the 40 students who made the greatest percentage the Low Group. The range of the percentage of grammatical errors for the High Group is from .35 to 1.67 and for the Low Group 3.21 to 6.20.

Summary of Results

1. In the initial testing on the Kirby Grammar Test, the students earned a mean score of 33.77 in ability to correct errors in sentences and a mean score of 23.89 in ability to match the proper grammatical principle

[24] Wert, James E., "A Technique for Determining Levels of Group Reading," *Educational Research Bulletin*, XVI (Mary 19, 1937), 113-116, Ohio State University.

to the correction made. In the final testing the mean scores for the same variables were 33.93 and 27.87 respectively. The mean score gains in the two abilities were .33 and 3.97 respectively.

2. The coefficient of correlation between the final test results on Sentences Corrected and Matched Principles of the Kirby Test was found to be .61, the coefficient of correlation between the same variables with the intelligence quotient held constant .47, and with the mental age held constant .47.

SUMMARY OF FINAL TEST INTERRELATIONSHIPS OF THE ELEVEN VARIABLES USED IN THE STUDY

	1	2	3	4	5	6	7	8	9	10	11
1. Kirby Sentences Corrected		.61	.55	.56	.55	-.21	-.06	.47	.46	-.18	.46
2. Kirby Matched Principles			.57	.71	.69	-.13	-.15	.56	.58	-.18	.55
3. Informal Sentences Corrected				.70	.62	-.23	-.14	.40	.41	-.19	.39
4. Informal Stated Principles					.76	-.27	-.13	.50	.50	-.28	.45
5. Informal Matched Principles						-.21	-.13	.52	.52	-.27	.44
6. Letter Errors								-.05	-.15	-.20	-.16
7. Composition Errors								-.20	-.17	-.11	-.15
8. Intelligence Quotients											
9. Mental Ages											
10. Chronological Ages											
11. Total Reading Comprhension											

3. Reading skills, except for the rate of reading, have significantly high relationships with the correction of errors in sentences and with a knowledge of functional grammatical principles. Reading skills have uniformly higher relationships with the final results on the Kirby Grammar Test than with the initial. The correlation between the Total Comprehension score in reading and Sentences Corrected is .46 and between the Total Comprehension score and Matched Principles .55 in the final test results. The correlations between reading skills and the gains made on the Kirby Test are practically zero.

4. The correlations between the intelligence quotients and mental ages and the Kirby Test scores are, in general, higher than the relationships of reading with them. They are consistently higher on the final test results and for Matched Principles than for Sentences Corrected. On the final results of the Kirby Test the correlation between Sentences Corrected and the intelligence quotients is .47 and between Sentences Corrected and the mental ages .46. The correlations between Matched Principles and the same variables reveal coefficients of .56 and .58 respectively.

5. The mean scores on the initial results of the Informal Grammar Test were for Sentences Corrected, 14.38; Stated Principles, 7.46; and Matched Principles, 6.48. The mean scores on the final results for the

same variables were 17.40, 16.42, and 9.22 respectively. The mean score gains were 2.93, 8.89, and 2.93 respectively.

6. In the final testing of the Informal Grammar Test the correlation between Sentences Corrected and Stated Principles is .70 and between Sentences Corrected and Matched Principles, .62. The correlations between these same variables with the mental age held constant are .63 and .52 respectively, and between the same variables with the intelligence quotient held constant are .63 and .53 respectively. The coefficient of correlations is, in every case, lowered by approximately ten points when either the intelligence quotient or mental age is held constant.

7. The correlations between the Total Comprehension score in reading and the parts of the Informal Grammar Test are higher than those between the same reading score and the parts of the Kirby Test. In the final testing on the Kirby Test the correlations between these variables increase; on the Informal Grammar Test they decrease. The correlations between the sections of the reading test and the gains made on the Informal Grammar Test are all low and for the part, Sentences Corrected, they are uniformly negative.

8. Correlations of intelligence quotients and mental ages with the parts of the Informal Grammar Test are of about the same significance as with the Kirby Test. They tend to be slightly higher for the initial than for the final test results, but there is not a marked difference. Correlations between the intelligence quotients and mental ages and the gains made on the grammar tests are so low as to be negligible.

9. In the free writing of letters and compositions there was only a slight gain in accuracy of usage, but it was somewhat greater for compositions than for letter writing.

10. The correlations of reading scores with accuracy in the free writing of letters and compositions are low but consistently positive. They are higher between reading scores and accuracy in compositions than between reading scores and accuracy in letters, but uniformly lower with the results of the final than the initial writings.

11. The correlations of chronological ages with all parts of both grammar tests are uniformly negative.

12. Coefficients of correlations between intelligence quotients and mental ages with accuracy in free writing are extremely low but consistently positive.

13. The correlations between all of the parts of the two grammar tests and the errors made in free writing are low but consistently positive.

14. The correlations of a knowledge of grammatical principles with accuracy in free writing reveal consistently higher coefficients when either the intelligence quotient or mental age is held constant.

15. The forty students of the experimental group who made the fewest errors in free writing, known as the High Group, were contrasted with a Low Group of forty students who made most errors. Of the High Group

10 students had been accelerated at the elementary level from one-half to two years and not one had ever failed. Of the Low Group 2 students had each skipped a half year and 6 students had failed in from one to two courses at the junior high-school level.

16. In the High Group, mathematics ranked as both the best and the least liked course. English and social science courses ranked second as the best liked. In the Low Group, English was the least liked subject with mathematics and the social sciences not far behind. The best liked course was mathematics.

17. The High Group had already studied 57 semesters of foreign language and were currently enrolled in 30 more as compared with 15 semesters already studied and a current enrollment of 7 for the Low Group.

18. The High Group not only reported more books read (107) as compared with the Low Group (54), but they also read books of greater maturity and better quality.

19. An average of 3.8 magazines each were read by members of the High Group as compared to 2.9 each for the Low. The quality of magazines for the High Group was considerably higher with a mean index quality of 84.25 as compared with 70.75 for the Low.

20. Eight different newspapers were listed as read by the two groups. The High Group reported the reading of 82; the Low Group of 72 newspapers.

21. A marked contrast existed between the two groups in reading skill. The mean score of the Total Comprehension in reading was 123.75 for the High Group and 82.37 for the Low.

22. The mean chronological age of the two groups differed by only 8 months, in favor of the High Group. The mean mental age of the High Group is three years above that of the Low and the mean intelligence quotient 20 points higher.

23. The parents of the students in the High Group spent 72 more years in school than did those of the Low Group.

24. The most marked differences in the occupations of the parents of the two groups were in those listed as professions and skilled labor. Thirteen parents of students in the High Group were occupied in the professions as compared with 2 in the Low Group, and 6 parents of students in the High Group were occupied in skilled labor as compared to 15 in the Low Group.

Conclusions

During the tenth school year in which these students studied grammar, they gained some slight facility in correcting errors in sentences and somewhat more in recognizing and recalling principles applicable to the corrections made, but the relationships of the latter with the former are scarcely great enough to indicate conclusively that a knowledge of grammatical principles has affected correcting ability.

A significant amount of correlation was found to exist between reading skills and all grammar abilities, and somewhat more between general mental

ability, grammar knowledge and correcting ability. It seems conclusively apparent that reading skill and general mental ability are factors contributing to correcting ability and to a knowledge of grammatical principles. The correlation between reading skill and the parts of the Informal Grammar Test is significantly high, the amount of correlation decreases with the final test results in spite of the fact that the mean and median scores indicate some actual improvement. These results point to the probable conclusion that the teaching of functional grammar to these tenth grade students has contributed little to their ability to correct errors in sentences and to use accurate English in their free writing. Such a conclusion is further substantiated by other evidence. The amount of correlation between grammar abilities and accuracy of usage in free writing is so low in every instance as to be negligible, and the students who use the greatest accuracy in their free writing are those who have the greatest amount of reading skill, the most general mental ability, and the most favorable cultural background. In view of these facts it seems doubtful whether the teaching of functional grammar has greatly affected ability to correct errors in sentences or the accurate usage of English in free writing. It seems possible and even probable that the tenth grade grammar curriculum does not offer ample opportunity for growth in the grammar abilities.

IMPROVING LINGUISTIC ABILITY AS A FACTOR IN SOLVING PROBLEMS IN ALGEBRA

REID HEMPHILL

This study is an attempt to answer the question: Can classroom teachers help pupils in beginning algebra to improve their ability to solve verbal problems by means of vocabulary study and by use of reading exercises that involve mathematical material? A verbal problem is defined, for the purposes of this study, as any problem stated in words from which the pupil is expected to derive and solve one or more equations.

Most of the beginning algebra textbooks now in use include many problems expressed in sentences. Studies of the usage of verbal problems, comparisons of the contents of algebra texts, and observations of college entrance examinations and of the reports of national committees seem to indicate that verbal problems are an increasingly important part of the subject matter of algebra. Most teachers of high school agree that verbal problems are an important and desirable part of the course. But these teachers also agree that many algebra pupils consider verbal problems the most difficult part of the course. According to the published opinions of a number of teachers, poor reading comprehension and lack of vocabulary knowledge are important contributing causes of the difficulties of these pupils. Experimenters have reported various amounts of improvement in pupils' ability to solve verbal algebra problems as a result of special emphasis either on the vocabulary used or on reading exercises that made use of mathematical material. The experimental groups, in most of these investigations, were not random samples of beginning algebra pupils, and were taught by the persons who had developed the teaching methods. These experimenters were probably superior to the average classroom teacher both in interest and in ability. Hence the results obtained by these investigators are not necessarily the same as those that would be obtained by most teachers, using the same procedures under ordinary classroom conditions. The pupils and teachers who participated in the present study were intended to be truly representative of algebra pupils and teachers in the eastern part of Kansas.

The basic text[1] used by all classes taking part in the experiment was the one adopted by the state for beginning algebra. The writer did not teach any pupils taking part in the experiment.

DESCRIPTION OF THE INVESTIGATION

The experiment was conducted during the first semester of the 1939-1940 school year. The pupils who participated were enrolled in ten different schools located in seven cities of eastern Kansas. An experimental and a control group were used. Over four hundred pupils in fourteen classes in

[1] Raleigh Schorling, John R. Clark, Rolland R. Smith. *Modern School Mathematics Book III.* Yonkers-on-Hudson, New York: World Book Company, 1936.

eleven schools began the experimental procedures. For various reasons all of the pupils in three of these schools dropped out of the experiment. Complete data were obtained for 241 pupils. These 241 pupils will be referred to in this report as the total experimental group. About 425 pupils in fifteen classes in eight schools served as controls. Test data were not complete on many of these individuals and entire classes in two of the schools were dropped. Complete data were obtained for 305 pupils. These

TABLE I

DISTRIBUTION OF PUPILS IN TOTAL EXPERIMENTAL GROUP AT THE BEGINNING OF THE YEAR

	Teacher	*School*	*Number of Classes*	*Number of Pupils*
	E-1	I	1	37
	E-2*	II	1	26
	E-3*	III	1	23
	E-4	IV	1	39
	E-5	V	1	37
	E-6	VI	3**	90
	E-7	VII	1	12
	E-8*	VIII	1	36
	E-9	IX	1	26
	E-10	X	2	65
	E-11	XI	1	11
Total	11	11	14	402

* Did not complete the experiment.
** One of these classes was not included in the final comparisons.

TABLE II

DISTRIBUTION OF PUPILS IN TOTAL CONTROL GROUP AT THE BEGINNING OF THE YEAR

	Teacher	*School*	*Number of Classes*	*Number of Pupils*
	C-1	I	2	72
	C-2*	II	1	30
	C-3*	III	1	19
	C-4	V	2	69
	C-5	X	2	58
	C-6	XI	1	16
	C-7	XII	4	98
	C-8	XIII	2	65
Total	8	8	15	427

* Did not complete the experiment.

pupils took the same initial and final tests as did the total experimental group and will be referred to as the total control group.

Table I shows the distribution of pupils in the total experimental group at the beginning of the year. It is read thus: teacher E-1 in school I taught one experimental class in which thirty-seven pupils were enrolled.

Table II shows the distribution of pupils in the total control group at the beginning of the year. It is read in a manner similar to that of Table I. The symbols given in these tables will be used consistently throughout this report to refer to the same teachers and schools.

Table III gives certain information regarding the schools that assisted in the experiment. These data were obtained from school officials or from the Kansas Educational Directory, compiled by George L. McClenny, State Superintendent of Public Instruction, October, 1939. In school IX only tenth and eleventh grade pupils were enrolled in algebra. In schools I, X, and XI most of the algebra pupils were in the ninth grade. In the remaining schools all of the algebra pupils were in the ninth grade.

TABLE III

DESCRIPTION OF SCHOOLS THAT PARTICIPATED IN THE STUDY

Schools	*Class of city*	*Organization*	*Enrollment*
I	1	Junior-senior high school	925
IV	1	Junior high school	309
V	1	Junior high school	496
VI	1	Junior high school	452
VII	3	Four year rural high school	130
IX	3	Four year rural high school	131
X	2	Junior high school	600
XI	2	Four year senior high school	92
XII	2	Junior high school	643
XIII	1	Junior high school	570

The teachers of classes in the experimental group were not selected because of any previously manifested interest in the relationship of vocabulary knowledge and reading comprehension to success in solving verbal algebra problems. They had not had special preparation in the experimental procedure; several of them were not even told of the experiment or asked to participate in it until after school had started. Table IV gives certain facts about the teachers who participated in the study. Thus, one teacher is designated as E-1 and also as C-1, meaning that this individual taught an experimental and a control section. The table also shows that this individual was a woman who had taught beginning algebra for more than five years before the 1939-1940 school year.

One hundred sixty-nine pupils from the total pupils experimental group and one hundred sixty-nine pupils from the total control group were

TABLE IV

INFORMATION REGARDING THE TEACHERS WHO PARTICIPATED IN THE STUDY

Teacher	*Sex*	*Previous experience*
E-1, C-1	Female	More than five years
E-4	Female	More than five years
E-5, C-4	Female	More than five years
E-6	Female	More than five years
E-7	Female	None
E-9	Female	More than five years
E-10, C-5	Female	None
E-11, C-6	Male	More than five years
C-7	Male	More than five years
C-8	Male	More than five years

matched on the basis of these five criteria: (1) chronological ages; (2) intelligence quotients; (3) scores on an arithmetic problem solving test; (4) scores on a reading test; (5) scores on an algebra problem solving test. These data were obtained in September or the first part of October, 1939.

To obtain chronological ages, the pupils were asked to give their ages in years and months in at least three different places: (1) the reading test, (2) the initial algebra test, and (3) the final algebra test. Some pupils were not paired because statements regarding their ages were contradictory.

If the school records contained an intelligence quotient for a pupil, that quotient was used. In case no such record was available, the Otis Self-Administering Tests of Mental Ability, Higher Examination, Form A were administered. The fact that the intelligence quotients of the pupils were obtained through the use of different intelligent tests was not considered a serious limitation, as this measure was only one of five used in equating the groups.

The arithmetic problem test used was Test II, Arithmetic Reading Test (Problem Analysis), by P. R. Stevenson. This test seemed especially applicable since the investigation was concerned with reading mathematical material.

A measure of reading ability of the pupils was obtained by use of the Iowa Silent Reading Tests, New Edition, Advanced Test, Form AM. Since the time required to administer the entire group of tests is longer than one class period in most schools, some of the subtests were omitted. The subtests used were: Rate-Comprehension, Directed Reading, Word Meaning, Sentence Meaning, and Paragraph Comprehension. The median of the scores made on these five subtests is referred to throughout this report as the "reading test score."

The algebra problem test was prepared by the writer of this report. Two experienced teachers of algebra, besides the writer, examined and criticized

the test before it was used. In a preliminary form it was given to several students during the summer preceding the experiment. The test contained twelve problems that were intended to be typical of verbal problems found in elementary algebra texts. The problems required the writing of formulas, substitution in equations, and the setting up and solution of equations. The working time of the test was forty-five minutes; a score of 125 points was possible. All teachers in whose classes the test was given were asked not to discuss the test with their pupils, either before or after it was administered. The same algebra test was readministered at the end of the experiment.

Table V shows the mean and standard deviation of each of the five variables used as bases for equating the groups. Pupils of the experimental and control groups were paired only if they were nearly equivalent with respect to each of the variables measured.

TABLE V

MEANS AND STANDARD DEVIATIONS OF FIVE MEASURES OF THE 169 MATCHED PAIRS OF PUPILS

	Experimental Group		*Control Group*	
	Mean	*Standard Deviation*	*Mean*	*Standard Deviation*
Chronological age (months)	175.3	8.2	174.3	8.0
Intelligence quotient	106.1	10.8	105.9	11.3
Arithmetic score	20.8	3.1	20.3	3.1
Reading score	71.7	10.3	71.1	10.3
Algebra score	16.1	11.2	15.8	11.4

The Experimental Method

The writer discussed with each teacher of an experimental class the importance of the relation existing between vocabulary knowledge, reading comprehension, and success in solving verbal algebra problems. The teachers were asked to emphasize frequently the vocabulary and the reading of mathematical material. It was suggested to them that study of verbal problems be distributed throughout the semester and not limited to a few consecutive days.

Near the beginning of the semester, the investigator supplied each teacher of an experimental class with a manual that presented his purpose and plan, and that suggested some procedures. Early in November some additional examples of reading exercises were sent to the teachers and near the end of the semester the teachers received a supplementary list of verbal algebra problems and some vocabulary tests. For each pupil in an experimental class the investigator sent a list of the uncommon words and phrases and of all mathematical words and phrases in the first eleven chapters of the algebra text. Parts of this vocabulary, arranged according to chapters in the text, were sent at intervals during the semester. The experi-

menter did not wish to standardize or to regulate explicitly the activities of the classroom. He planned to offer suggestions and allow the teachers freedom in carrying out the suggestions. Except for distributing the emphasis on verbal problems, vocabulary, and reading of mathematical material through the semester the teachers were free to present the materials of algebra in whatever order and manner they preferred. Some control was sacrificed in order to get a representative sampling of classroom procedures. The writer also conferred with each teacher after the experiment began.

The methods of the teachers of experimental classes and the amounts of time they devoted to the experimental procedures were not uniform. However, the experimental method may be summarized as follows:

1. Special efforts to master the vocabulary of the text.
2. Extensive reading exercises making use of mathematical material that required the pupils to:
   a. Translate English statements into algebraic expressions.
   b. Comprehend the problem situation.
   c. Note details.
   d. Select methods of solution.
   e. Distinguish relationships, (form equations).
3. Distribution throughout the semester of emphasis on verbal problems.

Pupils in the control group took the initial tests, used in matching pairs of pupils, and the algebra problem test at the end of the experiment. In no other manner was this group regulated or supervised by the experimentor.

Presentation and Interpretation of Results

The purpose of the teaching procedures and techniques used with the experimental group was to improve the ability of pupils to solve verbal algebra problems. The algebra test, constructed by the writer and given at the beginning of the investigation, was readministered at the end of the semester during which the experiment took place. It was assumed that the difference between final and initial scores on this test would indicate and

TABLE VI

MEANS AND STANDARD DEVIATIONS OF THE FINAL ALGEBRA TEST SCORES AND OF THE GAINS IN TEST SCORES BY 169 MATCHED PAIRS OF PUPILS

	Experimental		*Control*	
	Algebra Test	*Gains**	*Algebra Test*	*Gains**
Mean	43.0	27.9	39.9	24.7
Standard Deviation	21.4	16.3	19.0	14.1

* The mean gains as given in this table and elsewhere in this report are computed from the gains made by individual pupils and are not necessarily equal to the difference between the mean final and initial test scores.

measure any improvement in a pupil's ability to solve verbal algebra problems.

The achievements of the equated groups are summarized in Table VI.

As a consequence of the above described procedure, it appears that pupils derived some benefit from the experimental factors. The average gain by members of the experimental group was 3.2 points greater than the average gain by members of the control group. Expressed as a percentage, the average gain by members of the experimental group was nearly 13% greater than the average gain by members of the control group.

With recognition of the implied assumptions and the possibility of nonapplicability, the reliability of the obtained difference between gains made by members of the experimental and control groups was computed by use of the formula, S.D. difference=the square root of S.D. (av. 1)^2+ S.D. (av. 2)^2 The standard error of the difference so obtained was 1.65. By reference to a table given by Garrett[2] it is found that the chances are 97 in 100 that the true difference between the gains is greater than zero (the experimental group having made the greater gain).

Some teachers taught both experimental and control algebra classes. A description of these classes and presentation of results obtained by the teachers are given in Table VII.

TABLE VII

DESCRIPTION OF CLASSES AND PRESENTATION OF RESULTS OBTAINED BY FIVE TEACHERS WHO TAUGHT BOTH EXPERIMENTAL AND CONTROL CLASSES

Teacher	*No. of Classes*	*No. of Pupils*	*Mean Chronological Age*	*Mean I.Q.*	*Mean Arithmetic Score*	*Mean Reading Score*	*Mean First Algebra Score*	*Mean Final Algebra Score*	*Mean Gain*	*Difference*
E-1	1	32	180.6	100.9	19.6	70.9	11.9	38.1	28.1	
C-1	2	66	180.5	102.3	18.6	72.0	15.8	38.9	24.4	3.7
E-5	1	32	171.5	113.6	21.4	76.9	23.8	59.7	36.4	
C-4	2	54	170.4	111.9	21.8	73.1	25.2	56.1	31.1	5.3
E-10	2	49	181.6	108.9	20.4	71.7	16.8	41.4	26.0	
C-5	2	46	178.0	106.4	19.8	67.5	14.3	35.2	21.2	4.8
E-11	1	9	171.1	106.3	18.3	67.6	19.3	33.4	14.1	
C-6	1	13	174.9	105.0	17.5	66.8	9.3	17.2	7.8	6.3
E-2*	1	20	179.4	108.2	20.6	67.8	26.2	59.8	33.5	
C-2*	1	23	178.3	96.8	17.7	64.9	10.5	34.0	24.7	8.8

* Members of these two classes had studied algebra for 28 weeks when they took the final algebra test; hence their scores should not be compared with scores of other groups. Members of these classes are not included in the total experimental or total control groups.

[2] Henry E. Garrett, *Statistics in Psychology and Education*, p. 134. New York City, New York: Longmans, Green and Co., 1926.

In the case of each teacher the experimental group made a greater average gain than did the control group. This was true whether the experimental or control group made the higher average score on the initial algebra test. It seems important that groups of pupils taught by five teachers using the experimental procedures made greater gains in algebra problem solving than did groups taught by the same teachers not using these procedures, even though the experimental and control groups were not entirely equivalent.

Of the 169 matched pairs of pupils, thirty-nine pairs were boys, forty-three pairs were girls, forty-four pairs had boys as members of the experimental group and girls as members of the control group, and forty-three pairs had girls as members of the experimental group and boys as members of the control group. The gains made by these four classifications of matched pupils are presented in the following table.

TABLE VIII

COMPARISON OF GAINS IN ALGEBRA TEST SCORES MADE BY MATCHED PUPILS WHEN GROUPED ACCORDING TO SEX

	Mean Gains				*Difference in Mean Gains*
	Experimental		*Control*		
	Boys	*Girls*	*Boys*	*Girls*	*Experimental Minus Control*
Number = 39	28.3		26.5		1.8
Number = 44	25.3			23.1	2.2
Number = 43		30.4		28.0	2.4
Number = 43		27.7	21.8		5.9

Table VIII should be read as follows: In the second line, forty-four boys of the experimental group were matched with forty-four girls of the control group. The mean gain of the boys in the experimental group was 25.3 points. The mean gains of the girls in the control group was 23.1 points. The mean gain of this experimental group exceeded that of the control group by 2.2 points.

In each classification, the mean gain of the experimental group exceeded that of its control group. The two greatest differences between mean gains of experimental and control groups occurred when girls were members of the experimental groups. If girls are not accustomed to reading material similar to that in the algebra problems, the emphasis in the experimental classes on the reading of mathematical material might cause them to gain more than the boys in ability to solve verbal algebra problems.

The members of the experimental and control groups were arbitrarily divided on the basis of intelligence quotients into high, average, and low ability groups. In the high ability group were placed pupils having I.Q.'s of 115 or higher; in the average ability group were placed pupils having I.Q.'s of 96—114 inclusive; and in the low ability group were placed pupils hav-

ing I.Q.'s of 95 or less. Table IX presents the mean gain and number of pupils in each ability classification for both experimental and control groups.

TABLE IX

COMPARISON OF GAINS IN ALGEBRA TEST SCORES MADE BY THE TWO GROUPS WHEN CLASSIFIED ACCORDING TO I.Q.

	Low 95 or less		*Average* 96-114		*High* 115 or more	
	Number	*Mean*	*Number*	*Mean*	*Number*	*Mean*
Experimental	30	18.5	98	26.7	41	37.7
Control	35	22.8	97	23.7	37	29.3

This table should be read thus: of the experimental group, thirty members had I.Q.'s of 95 or less and made an average gain of 18.5 points, ninety-eight members had I.Q.'s of 96-114 inclusive and made an average gain of 26.7 points, and forty-one members had I.Q.'s of 115 or more and made an average gain of 37.7 points.

The data of table IX suggest that the experimental procedures did not benefit pupils of the lowest ability sections but that these procedures gave pupils of higher mental levels opportunity to develop their ability to see and express the relationships of verbal problems. The average gain of the experimental pupils in the high ability classification is more than twenty-eight percent greater than the average gain made by control group pupils of the same ability classification.

The pupils taking part in the experiment were not given a standardized algebra achievement test. However, as an aid in comparing the classroom procedures of the experimental and control classes and in order to obtain opinions regarding the value of the work done and its effect on the pupils, unlike questionnaires were sent, to the teachers of experimental and control classes after the experiment had ended. All of the teachers replied. The investigator was gratified to know that all teachers of the experimental and control groups shared his opinion regarding the relationship between both reading ability and vocabulary and ability to solve verbal algebra problems.

The teachers were asked to express their opinions regarding achievement of pupils in the experimental group. Since these opinions are the only available measure of the pupils' achievement in all the materials of first semester algebra, it is important that none of the teachers believed that the pupils had suffered any loss with reference to techniques or understanding of algebra because of time devoted to the vocabulary and reading of verbal problems. However, several of the teachers stated that the experimental classes were a little behind the teacher's schedules of previous years and some teachers admitted having restricted their emphasis on the experimental procedures in order to reach a certain point in the subject matter of algebra by the end of the semester. The experimental procedures

were considered to be of sufficient value that the teachers asserted that they expect to use similar material in their algebra classes next year.

The information gained from these questionnaires made it evident that the activities of the experimental classes were not very different from those of the control classes. Most of the teachers of control classes defined the new words and phrases that were necessary in order to understand the problems. They tested, in one manner or another, the pupils' mastery of the meaning of these words and phrases. Half of the teachers of control classes used supplementary material that required the reading of statements of relationship and the expressing of these relationships by use of algebraic symbols. The experimental classes spent only six or seven more days than did the control classes in the study of verbal problems.

The findings of the investigation and any conclusions drawn are qualified and conditioned by the limitations of the study itself. Some factors that may have influenced the results are: (1) Perhaps all possible influence of vocabulary knowledge and reading comprehension upon the ability of pupils to solve verbal algebra problems was not exerted or tested in this experiment. (2) The test used to measure improvement in ability to solve problems may have been inadequate or biased. (3) The obtained difference in ability to solve verbal problems. assuming that it actually exists, may have been caused by factors other than the experimental procedures.

The findings of the study, admitting its limitations, may be summarized as follows:

1. In the two equated groups the mean gain made by pupils of the experimental group was nearly thirteen percent greater than the mean gain made by pupils of the control group.

2. Of the ten teachers assisting in the experiment, four taught both experimental and control classes. In the case of each of these teachers the mean gain made by members of the experimental class exceeded the mean gain made by members of the control class or classes.

3. The superiority of the experimental group did not seem to be caused to any great extent by the sex factor. Possibly the slight indicated superiority of the girls was caused by their previous reading habits.

4. The gains made by pupils of the experimental group whose I.Q.'s might place them in a high ability classification, exceeded the gains made by pupils of the control group having a similar I.Q. classification; the gains made by pupils of the experimental group whose I.Q.'s might place them in a low ability classification did not exceed the gains made by pupils of the control group having the same classification.

5. Teachers of the experimental group did not believe that the pupils suffered any loss in the techniques or understanding of algebra because of the time devoted to the experimental procedures. Some of the classes were slightly behind the teacher's schedules of previous years.

6. The experimental procedures seemed to be quite similar to teaching procedures used by many good teachers of algebra.

The findings given above seem to justify this conclusion: Most pupils in beginning algebra will improve in ability to solve verbal problems if, under the supervision of their classroom teachers, they effectively study the vocabulary of their text and selected reading exercises that involve mathematical material. Pupils of superior mental ability seem more likely to benefit by such study procedures than pupils of average or low mental ability.

THE ADMINISTRATION OF STUDENT PARTICIPATION IN CERTAIN HIGH SCHOOL ACTIVITIES

J. Marc Jantzen

The Problem

Increasingly school administrators are recognizing the educational values arising from students' participation in the various activities of the secondary schools. The present investigation is a study of the extent of student particicpation in certain aspects of planning and carrying out assembly programs in high school, and the extent of student participation in certain aspects of the government of the school. These activities were studied in the light of the newer concept that schools should provide students with social experiences which lead to democratic group behavior. The study attempted to find evidences of the presence or absence of democratic student participation.

"Extent of participation," as used here, refers to five degrees of participation. These are *always, usually, sometimes, rarely,* and *never.* The writer assumes that

(a) Democracy furnishes a satisfactory pattern whereby social groups may function.

(b) Schools, consisting of students, teachers, supervisors, administrators, and other school employees, constitute social groups.

(c) Schools, as social groups, imply some degree of interaction by and with the individuals who constitute the social groups; therefore, learning how to live democratically in social groups may be facilitated through social experiences in the schools.

(d) Schools are organized social groups which should have programs of student activities.

Historical Background

Student participation in school activities is not merely an educational development of the twentieth century. Aristotle appointed one of his students to serve as "Archon" of the school for ten days, after which another student was selected. Students made the course of study and regulated their own conduct in the University of Salerno, 1060. During the Middle Ages the student body at the University of Paris was divided into nations, each group responsible for the discipline of its citizens. Jesuit schools had "squad leaders" whose duty it was to hear the recitations of other students. As early as 1500 Trotzendorf organized a student senate similar in many respects to the contemporary student councils. Rousseau emphasized the spontaneous development of the individual. His writings have influenced the contemporary concept that students should be active participants in school activities. Pestalozzi was one of the first to maintain that education must proceed largely by doing. The early nineteenth century witnessed the

popularization of the Lancastrian "monitorial" schools in which student monitors taught and promoted other students. During this century such English schools as Rugby and Eton developed the idea that older students were to be responsible for a type of character training of younger boys. Writers in the early twentieth century used the term "student self-government" extensively. In practice this seems to have been student participation instead. The latter term is used and practiced increasingly at present.

Several recent investigations have attempted to secure data on student participation in school activities. The Cooperative Study of Secondary School Standards in 1936-37 asked 17,246 students in 200 high schools for responses regarding the number of activities available, how much students participated, and how valuable such participation was.[1] The National Survey of Secondary Education, in its study of the nonathletic extracurriculum activities secured replies with reference to an appraisal of the extracurriculum activities from adults who had participated in such activities while in high school.[2] The New York Regents' Inquiry, in evaluating the qualities and attainments of leaving students, found that extracurricular activities were usually initiated and almost entirely dominated by the faculty in the great majority of schools, and that most of the activities seldom gave opportunity for the development of student initiative and leadership.[3]

The Method of Procedure Employed in This Study

The writer formulated a number of evaluative statements having to do (1) with student participation in planning and giving high school assembly programs and (2) with student participation in student council work. The technique of selecting evaluative statements follows the general procedure used by the Cooperative Study of Secondary School Standards in setting up its "Evaluative Criteria."

With the evaluative statements as basis, a questionnaire to serve as the device in measuring the extent of participation was constructed. The questionnaire was given to 43 students in two trial schools. It was then revised and given to 830 students in 24 Kansas high schools with enrollments between 250 and 600 students. Each school superintendent or high school principal chose 20 per cent of the juniors and seniors in his school, who were asked to answer the questions. Students were chosen on the basis of leadership in school activities. The writer personally administered the giving of the questionnaire in each of the schools. Each administrator prepared a list of the scholastic grades made by each of the selected students. Four of the schools did not have a student council, or any similar

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1 *Evaluation of Secondary Schools: General Report*, Pp. 141-145, 744 Jackson Place, Washington, D.C., 1939.

2 *Nonathletic Extracurriculum Activities*, by William C. Reavis and George E. Van Dyke, National Survey of Secondary Education, U. S. Office of Education, Bulletin 1932, No. 17, Monograph 26, 1933.

3 Spaulding, Francis T., *High School and Life*, Pp. 144-148, McGraw-Hill Book Co., 1939.

organization. Students in these schools omitted the part of the questionnaire dealing with participation in the government of the school.

PARTICIPATION IN ASSEMBLY PROGRAMS AND IN STUDENT COUNCIL

In order to be able to compare one group with another, it seemed desirable to secure a single index number for each question. A percentage number was, therefore, adopted. It was assumed that the maximum possible score on any question was 100 per cent. In order to show students' choices of the five possible answers as a single index number in the form of a percentage score, each was weighted. The plan of weighting used assigned the value of four to *always* and a value of zero to *no*. A percentage score was secured by dividing the students' weighted score by the maximum total score. To illustrate the process, the results of the fourth question in the section having to do with "Giving Assemblies" (see Table I) are given below:

(Yes, no) Are the assembly programs which are presented by students of such a nature
72 that more than merely a few students participate in each assembly?

a. If your answer is yes, how often do more than merely a few students participate in each assembly?

Always,	*usually,*	*sometimes,*	*rarely*
57	451	197	22

57 × 4 =	228
451 × 3 =	1353
197 × 2 =	394
22 × 1 =	22
72 × 0 =	0
799	1997

$$\frac{1997}{799 \times 4} = 62.5 \text{ per cent}$$

The 62.5 per cent means that the assembly programs in the 24 schools included in this investigation were presented by relatively large groups of students only 62.5 per cent of the times that assembly programs were given.

The converse of the above plan was used with some questions by assigning *no* the value of four, *rarely* the value of three, et cetera. This is true in the question, "Do teacher-advisers insist on including numbers on the assembly programs which the teachers want especially? (See Item A3, Table I.) Placing the weightings in reverse order leaves the maximum score at 100 instead of at zero.

Two exceptions to the illustrated plan of weighing students' answers were made. In the question, "Do the teacher-advisers in council meetings suggest to student members of the council what to do or how to do it?" (See Item C3, Table I.) *sometimes* was given the value of four, *rarely* three, *usually* two, *no* one, and *always* zero. Also in the question, "Does the student council consider helping solve the disciplinary problems of the school as part of its duties?" (See Item C11, Table I.) *rarely* was weighted four, *sometimes* three, *usually* two, *always* one, and *no* zero.

The aggregate of students' responses given under five choices of possible answers to each question, together with the extent of participation in

each, are presented in Table I. The individual questions have been contracted into brief statements. An explanation of how to read the first item in the table will make clear how to read the succeeding ones. Of the 814 students who answered the first question, 74 underlined *always*, 403 *usually*, 276 *sometimes*, 34 *rarely*, and 27 *no*. The extent of participation is represented by the percentage score of 61.1. This score means that students assisted in planning assembly programs to the extent of 61.1 per cent of the possible number they might have helped plan. In each of the three divisions in Table I are these items: "Students rate own efforts" and "Students rate others." Students were asked whether they did their best and whether they thought other students contributed all they possibly could in planning and giving assembly programs and in student council work. Students rated their own efforts 9 to 11 points higher than those of others. Item B5 referred to special days, such as Armistice Day or Washington's birthday.

Students' opinions show that schools are failing to give adequate opportunities for participation in the activities investigated. The items, with scores, revealing this failure include the following: (1) help decide on the kind of assemblies to be given, 20.4; (2) chairmen for assemblies are trained for their task, 18.8; (3) school problems are discussed in forum discussions in assembly programs, 13.2; (4) students assist in evaluating assembly programs, 25.0 and (5) the student council trains leaders for various student activities, 14.1.

Comparison of Judgments According to School Marks Received by Students

An attempt was made to perceive any relationship between the judgments given by students making the so-called "low" scholastic grades with the judgments given by students making "high" grades. Table II presents a comparison of students' judgments on 16 items grouped into four divisions representing four levels of school marks. The first column of figures presents the extent of participation on the basis of 236 answers of students whose grade point average was 1.4 or less (considering an A grade as 3 points, B grade as 2 points, et cetera). The second column represents 207 student judgments, the third 202 and the fourth 170. The data reveal that students with the lowest grade point average differed very little in their judgments in respect to student participation in certain school activities from judgments made by students with the highest grades.

Each administrator was sent a summary of the replies made by his students. He was asked to evaluate the opinions his students had given in terms of whether students had judged the particular activities with some degree of accuracy or not. Of the 24 superintendents and principals, replies were received from 23. Of these, 22 stated that the summarized report sent them did represent in general a rather accurate picture of the extent of student participation, and that the summarized students' judgments were true appraisals of the activities concerned.

TABLE I

Data Pertaining to the 24 Schools, Giving a List of the Questions in Contracted Form, an Aggregate of Students' Responses to the Items in the Questionnaire Listed under Five Possible Choices of Answers, and the Extent of Participation Represented by a Percentage Score Giving the Average of the Weighted Judgments.

		Student's Answers					
	Items of Questionnaire	*Always*	*Usually*	*Sometimes*	*Rarely*	*No*	*Extent of Participation*
	Planning Assemblies						
A1.	Students help plan	74	403	276	34	27	61.1
A2.	Teachers advise	797				14	98.3
A3.	Sponsor wants his way	2	46	159	53	492	82.8
A4.	Students want their way	2	6	25	43	685	96.1
A5.	Sponsor ignores other	3	8	40	33	703	95.3
A6.	Students oppose sponsor	3	7	43	40	674	94.8
A7.	Served on committee	491				318	60.7
A7c.	Students rate own efforts	252	207	28	2		86.2
A7d.	Students rate others	117	303	62	6		77.2
A8.	Help decide the kind	11	46	189	97	464	20.4
	Giving Assemblies						
B1.	Student chairmen preside	145	243	119	175	115	54.0
B2.	Chairmen are trained	37	90	65	13	540	18.8
B3.	Students give assemblies	87	372	227	118	2	63.1
B4.	Many students participate	57	451	197	22	72	62.5
B5.	Give special assemblies	63	234	252	89	168	47.9
B6a.	Hold forum discussions	3	16	141	85	561	13.2
B6b.	Students take part	11	71	62	87		50.7
B7.	Help evaluate programs	14	66	204	127	378	25.0
B8.	Helped give assemblies	735				80	90.2
B8c.	Students rate own efforts	552	172	3	1		93.8
B8d.	Students rate others	268	408	42	2		82.7
	Student Council						
C1.	School has council	649				27	96.0
C2.	Members are elected	598	38	2	3	25	94.3
C3.	Sponsor gives advice	50	244	248	16	6	68.0
C4.	Sponsor wants his way	16	42	69	43	367	82.7
C5.	Students want their way	1	3	33	55	459	93.9
C6.	Sponsor ignores others	4	6	16	24	532	96.1
C7.	Students oppose sponsor	1	1	16	42	494	96.3
C8.	Members "give and take"	99	327	60	7	37	70.9
C9.	Council trains leaders	18	49	38	15	429	14.1
C10.	Council helps make rules	41	221	164	44	151	48.2
C11.	Helps with discipline	27	50	82	143	233	44.1
C12.	Council sponsors court	3	1	10	14	593	98.0
C13.	Principal uses veto	14	26	119	131	182	73.3
C14.	Served on council	284				383	42.6
C14a.	Students rate own efforts	151	98	7	5		87.8
C14b.	Students rate others	64	151	45	2		76.4

TABLE II

A Comparison of the Extent of Participation Classified into Groupings on the Basis of Four Levels of School Marks, with the Differences between the Highest and Lowest Scores.

	Items of Questionnaire	*Grade Point of 1.4 or less*	*Grade Point of 1.5 to 1.9*	*Grade Point of 2.0 to 2.4*	*Grade Point of 2.5 or more*	*Difference of Highest, Lowest Score*
	Planning Assemblies					
A1.	Students help plan	63.7	64.2	64.9	63.9	1.2
A3.	Sponsor wants his way	83.1	83.3	81.5	85.3	3.8
A4.	Students want their way	96.4	96.5	95.4	96.5	1.1
A7c.	Students rate own efforts	84.6	85.4	89.1	86.8	4.5
A7d.	Students rate others	77.3	76.1	76.8	80.6	4.5
A8.	Help decide on kind	15.6	23.4	23.5	21.5	7.9
	Giving Assemblies					
B1.	Student chairmen preside	51.1	51.9	61.5	54.5	10.4
B3.	Students give assemblies	61.6	64.9	64.9	62.8	3.3
B4.	Many students participate	60.1	62.7	65.0	62.9	4.9
B6.	Hold forum discussions	16.3	12.2	11.8	9.8	6.5
B7.	Help evaluate programs	26.6	25.5	26.0	21.4	5.2
	Student Council					
C3.	Sponsor gives advice	72.2	63.1	63.6	71.0	9.1
C8.	Members "give and take"	70.6	69.0	72.4	71.7	3.4
C9.	Council trains leaders	19.1	13.2	13.8	9.2	9.9
C10.	Council helps make rules	48.8	48.0	50.5	45.2	5.3
C13.	Principal uses veto	73.6	74.3	69.3	77.8	8.5

Findings

1. The present investigation attempted to find the extent of participation in certain high school activities. A questionnaire was answered by 830 students in 24 different high schools between January 26 and May 5, 1940.

2. The data show that students sometimes help plan assembly programs, although this varies with individual schools from rarely to always.

3. Sponsors of assembly programs rarely insist on the adoption of their particular plan, but the range is from sometimes to never.

4. Students in planning assembly programs hardly ever insist on their plan of procedure against the better judgment of the sponsor; the sponsor never ignores suggestions made by students; and students never ignore the sponsor.

5. Sixty per cent of 809 students had served on one or more assembly committees; however, the range is from 94.7 per cent of 19 students in one school to 7.7 per cent of 26 students in another school.

6. Students rarely have an opportunity to help decide what kind of assembly programs are to be given.

7. Students sometimes preside as chairmen at assembly programs. The range by individual schools is from almost always to practically never.

8. When students do preside as chairmen at assembly meetings, they are rarely given any special training for this task.

9. Students present 60 to 65 per cent of the assembly programs that are given. In approximately one-half of these assemblies more than merely a few students participate.

10. Students sometimes present special assembly programs, as for example, an Armistice Day program, instead of using "outside talent." With individual schools this varies from never to usually.

11. Forum discussions to consider problems confronting the high school are almost never included in any assembly program.

12. Students rarely have an opportunity to evaluate programs that have been given.

13. Ninety per cent of 815 students have appeared on one or more assembly programs. The range is from all the selected students in seven schools to 58.6 per cent at the opposite extreme.

14. Sponsors of student councils rarely insist on having their way; students never insist on the adoption of their suggestions; the sponsor never ignores students' suggestions; and students never oppose the sponsor.

15. Student councils almost never consider the development of training of student leaders for different student activities as part of their tasks. In the best school the council only rarely accepts this responsibility.

16. The student councils sometimes help make school regulations. Variations by schools are from usually to rarely.

17. The principal rarely needs to use his veto power to block student council legislation; however, the range is from never to occasionally.

18. Of 667 students, 42.6 per cent had served as members of the student council. One-half of 139 students making the highest scholastic grades had been members of the council, while one-third of 183 students having the lowest school marks had been members of it.

19. Responses made by girls differ hardly any from those made by boys; and juniors are in almost complete agreement with seniors.

20. Students with "poor" scholastic marks gave almost the same judgments on the various questions as students with "high" scholastic records.

21. Twenty-two of 23 administrators stated that the data furnished by their students did represent a rather accurate picture of the extent of student participation in the particular activities investigated.

Conclusions

The principles underlying democratic modes of living furnish a satisfactory pattern whereby social groups may function. Schools, consisting of students, teachers, administrators, and others, are social groups in which the principles of democratic action should operate. If the schools follow a democratic social policy, they will encourage cooperative relationships between students and staff members, among staff members, and among students.

The present investigation concerned itself with student participation in planning and presenting assembly programs and with student participation in student council work. The data collected throw some light on student-sponsor relationships. On the basis of the findings, the conclusion is made that the student-sponsor relationships in the schools investigated were of a cooperative nature. The social force of cooperation was evidently in almost constant operation in the association of sponsors and students in committee meetings, in presenting assembly programs, or in student council sessions. This cooperative attitude is indispensable to the democratic functioning of the school.

The data show that sponsors rarely insist on the adoption of their particular plans; students never insist on their plan of procedure; sponsors never ignore students' suggestions; and students never oppose sponsors. Student participation in school activities results in more or less active interaction of students and sponsors. Many of the social experiences that schools offer students find expression through the joint activities of teachers and students. In the particular activities of concern here, a desirable student-sponsor relationship has been achieved to a large extent.

A democratic social policy also means that schools should assume the responsiblity of providing their students with social experiences in order to facilitate learning how to live in social groups. Public schools should maintain and demonstrate those human relationships which are indispensable to the perpetuation and functioning of a democratic society. The committee planning an assembly program, the group of students preparing to present an assembly program, or the student council in session can provide learning situations in which students may apply knowledge and reason in coping with the adjustments in their own social groups. These opportunities for social experiences should facilitate group behavior of students in the years ahead when these students should assert their rights and discharge their duties as active citizens of a much larger group than the school in which they have been functioning factors.

The 24 schools in this study did not provide their students with adequate opportunities to engage in social experiences through participation in planning and giving assembly programs and in student council work. Students assisted in planning assembly programs to the extent of 61.1 per cent of the possible number they might have helped plan. Students rarely have an opportunity to help decide on the kind of programs to be given, nor to evaluate programs that have been given. Students presented 60 to 65

per cent of the assembly programs, with more than merely a few students participating in only about half of the programs. Students sometimes preside as chairmen at assembly programs; however, these chairmen are rarely given any training for this task. Forum assembly meetings to discuss problems confronting the high school are practically never included in any assembly program. Student councils almost never help develop and train student leaders for various activities. Student councils help make school regulations regarding corridor traffic, parking cars on the school grounds, or other school problems only sometimes.

From the foregoing findings, two general conclusions are drawn: (1) that a cooperative relationship exists between students and sponsors in the particular activities investigated, but (2) that these schools are failing to provide their students with adequate opportunities to engage in social experiences in planning and giving assembly programs and in student council work. While administrators profess to operate schools on a democratic basis, the data show that opportunities for democratic participation were limited in the student activities investigated.

STUDENT-TEACHING AND LATER SUCCESS IN TEACHING

L. Avery Fleming

The Problem—Its Purpose and Assumptions

The aim of this study is to analyze and interpret data collected from former student-teachers after some years of teaching experience, for the purpose of answering on the basis of their experience and judgment, the following questions relative to the training of high school teachers:

1. What are the provisions for student-teaching in the twenty-one institutions included in this study?

2. What is the relative amount of attention given to each of seventy-four student-teaching activities described in the check list used in this study?

3. What degree of difficulty do student-teachers experience in carrying out these activities?

4. To what extent have the student-teaching activities been helpful in later teaching?

5. What emphasis do high school teachers think is needed on each of the seventy-four activities designated in student-teaching?

6. What are the outstanding student-teaching activities, problems and difficulties reported by high school teachers?

7. What suggestions do high school teachers have for the improvement of student-teaching?

The important place which student-teaching has in practically all teacher-education institutions, the costs involved, and the recent trends toward a new appraisal of nearly all phases of teacher training give significance to this problem. There is increasing demand for more emphasis on the type of social and personal problems the prospective teacher is likely to encounter in actual teaching situations.

The following basic assumptions are implicit in this study: (1) student-teaching is a valuable and essential part of the training of high school teachers; (2) data with reference to student-teaching factors and later teaching success should be obtainable from experienced teachers; (3) teachers are competent to judge the relative values of the activities listed; (4) the check list used contains an adequate sampling of the important activities emphasized in the student-teaching courses offered by the colleges included in this investigation; and (5) the data used in this study are sufficiently representative, reliable and valid to warrant recommendations and conclusions.

Procedures Used in the Investigation

The procedures used for the investigation of the problem are as follows:

1. The construction and use of a questionnaire containing a check list and eight major inquiries.

2. Personal interviews with teachers.

3. Personal visits to Kansas colleges.

4. A study of catalogues, manuals, forms, reports and bulletins issued by the institutions included in this study.

5. A study of literature in the field of teacher-training.

6. Utilization of the writer's experience as a supervisor of student-teaching.

Four hundred forty-four usable, completed questionnaires were obtained from the original and two follow-up requests. Two hundred twenty-three men and two hundred twenty-one women returned completed forms. The median teaching experience of the teachers reporting was twenty-four months.

An attempt was made to check the reliability of the data and if possible to add to it by means of personal interviews held with twenty high school teachers who had previously filled out and returned the questionnaires. The three general types of high schools in the state and eight of the twenty-one teacher-education institutions included in this study were represented by the teachers who were interviewed.

Student-Teaching in Kansas Colleges

Pertinent data with reference to student-teaching in Kansas colleges were obtained from catalogues and descriptive materials issued to the institutions, from questionnaire returns and personal interviews, and by means of personal visits made to fifteen of the institutions offering student-teaching courses for prospective high school teachers.

1. There is general agreement in the teacher training field that adequate laboratory-school facilities are necessary for an effective program of student-teaching. Three of the teacher-education institutions included in this study provided laboratory-school facilities in their own training schools. Twenty institutions provided for student-teaching experiences in cooperating public high schools. Academies were used for the training of only a few student-teachers.

Bagley has stated that the minimal requirement for student-teaching facilities should be the ratio of four pupils enrolled to one college senior student enrolled.[1] The number of pupils enrolled in the three training schools fell below this standard, but pupil enrollments in the cooperating high schools were adequate for laboratory-school purposes. The same general conditions prevailed with reference to the Standards of the American Association of Teachers Colleges for 1930.

It is generally agreed that teacher-education institutions should have control of teacher-training facilities. Since practically all of the Kansas colleges use local high schools for training purposes, it follows that adequate control by the colleges is often lacking. Some kind of agreements with

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[1] Learned, W. S., Bagley, W. C., and others, "The Professional Preparation of Teachers of American Public Schools," pp. 193-195. *Carnegie Foundation for the Advancement of Teaching.*

local boards of education were made, but only two colleges had written contracts.

There was little uniformity in the amount of fees charged for student-teaching courses in the institutions studied. Fifteen of the institutions charged fees for the courses and paid the collected fees directly to the boards of education or to the cooperating teachers in the affiliated high schools. In at least three colleges the cooperating high school teachers did not receive extra pay for the supervision of student teachers.

2. The three teacher-training institutions which maintained their own training schools had staff personnels which varied considerably from those found in colleges which used public high schools for training purposes. The close connection of the training school staff members with the regular staff members in the respective institutions provided for better integration of the entire teacher training program. The organization of the staff for student-teaching purposes was also more definite. Practically all supervisory and administrative members of staffs responsible for student-teaching in Kansas colleges held either the doctor's degree or the master's degree, and a substantial majority of the cooperating high school teachers held the master's degree. Of fourteen colleges studied with respect to the selection of cooperating teachers, student-teachers were assigned to the "best" cooperating high school teachers in nine instances.

3. Selective admission of students, while not the problem of this study, is closely related to student-teaching factors and later success in teaching. Since the five state institutions have placed few restrictions on the admission of high school graduates to teacher-training curricula the other teacher-education institutions have followed the same practice. With few exceptions, however, only students of senior standing are admitted to student-teaching courses for prospective high school teachers. This factor alone is probably important in the selection of student teachers.

Ten of the Kansas colleges which train teachers required an average scholarship standing of "C" in all college courses, and four colleges required a grade of "C plus." One college required a grade of "B" in the subject taught by the student-teacher. Seven colleges had no definitely established scholarship standard. The three professional courses that were most frequently prerequisite to, or concurrent with student-teaching courses were high school methods of teaching, educational psychology and general psychology.

In all of the Kansas colleges the applicant was required to make application for the course in student-teaching. Only a few of the colleges utilized the subject-matter instructors in the selection of student teachers. In the fifteen Kansas teacher-education institutions visited by the investigator the director of student-teaching most frequently assigned student-teachers to their places in the laboratory schools.

4. Student-teaching courses for prospective high school teachers were offered under eight different titles, "Supervised Teaching" being used most frequently. Eleven of the colleges granted three semester hours of credit

for the course, six colleges granted four hours credit, two colleges gave one to four hours credit, one gave three or four hours credit, and one college granted either three or five hours credit. One college granted a maximum of six semester hours credit to students in music and physical education.

Eleven Kansas colleges offered student-teaching courses both semesters of the school year. Only four institutions offered student-teaching courses on the secondary school level during the summer months. Three colleges granted exemptions from student-teaching courses to students who had three years of teaching experience in the field.

Kansas colleges quite generally required student-teachers to teach subjects in their major or minor fields. Six colleges assigned only one student-teacher at a time to any one high school class, but seven colleges varied from one to three or more assignments per class, although more than three assignments to one class were made very rarely.

5. In eight Kansas colleges the director of student teaching and the cooperating or "critic" teacher composed the supervisory staff. In two colleges the cooperating teacher supervised practically all the student-teaching activities. Four other combinations of supervisory personnel, including the city superintendent and the high school principal have also been used.

In the colleges visited, student teachers were inducted into teaching by three steps, namely, observation, participation, and responsible teaching. Very few supervisors used definite observation techniques. The amount of time devoted to observation varied from two to ten weeks. One college provided free half-days for a total of ten hours observation. Another college assigned student-teachers to teach one unit, then observe, and then teach again.

The institutions that were accredited by the American Association of Teachers Colleges followed in general the recommendations of that association "that at least two-fifths of the teaching in the training school should be done by regular members of the training school or by other members of the faculty,"[2] but there was no consistent time pattern in the state as a whole. The amount of time devoted to responsible student-teaching in twelve Kansas colleges varied from "very little" to thirty-five clock hours.

Student-teachers participated very little in extra-curricular activities during the period of responsible teaching. A number of the colleges devoted much time to lesson planning while others gave little attention to the planning of lessons. All of the colleges that were visited provided for individual conferences with student-teachers, usually "as needed." Group conferences with the director of student-teaching or with the supervisor were held weekly in thirteen colleges. Of the ten directors of student-teaching interviewed by the writer, only two expressed the opinion that the "degree of integration of educational experience in student-teaching" was satisfactory.

In eight of the colleges that were visited, the final mark for the courses in student-teaching was determined cooperatively by the supervisory per-

[2] "Standards for Accrediting Teachers Colleges," *12th Yearbook*, The American Association of Teachers Colleges, 1933.

sonnel for each student-teacher. In five colleges the grade was determined by the cooperating teacher alone. Two institutions used teacher score-cards for determining the final grade.

Appraisal of Findings Obtained by Use of Check Sheet

The four major headings used in the questionnaire forms were: (1) Amount of attention given to each activity in your practice-teaching; (2) Degree of difficulty in carrying out each activity in practice-teaching; (3) Extent to which your practice-teaching has helped in later teaching; and (4) Emphasis you think is needed on each activity in practice-teaching. The high school teachers to whom the questionnaires were mailed were requested to check each of seventy-four student-teaching activities under the above four major headings. In order to make the necessary comparisons and appraisals an "average rating" score was determined. This score was derived from a modification of Roy C. Bryan's technique.[3] On the basis of the assumptions implicit in this study, the more closely the "average rating" score approached 100 the greater was the "amount of attention," the "degree of difficulty," the "extent of helpfulness," or the "emphasis needed" with references to the seventy-four student teaching activities.

1. The amount of attention given to the seventy-four student-teaching activities in ten areas is indicated in Table I. The two areas receiving the greatest amount of attention in Kansas teacher-education institutions, according to teacher reports, were the areas relating to the "selection and organization of subject matter" and the "selection, planning, and application of methods of instruction." The average score in each of these areas was seventy-five. The amount of attention given to six of the remaining areas of student-teaching activities is represented by scores ranging from sixty to sixty-eight. The scores representing the ratings in the amount of attention given to extra-curricular activities and to community affairs indicated relatively little attention given to the use of community resources. If "the context of contemporary education is moving out to include the use of community resources"[4] in order to educate the whole child, high school teachers must become increasingly experienced in community life and living. This was the essence of the New College program of teacher training, which is being continued in Springdale School.[5]

2. The degree of difficulty reported by high school teachers in carrying out the seventy-four student-teaching activities is summarized in Table II. Those responsible for student-teaching courses which emphasize the activities included in this study should be able to discover in these comparisons certain important implications for student-teaching schedules and programs.

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[3] Bryan, Roy C., "Pupil Rating of Secondary School Teachers," Contributions to Education No. 708, Teachers College, Columbia University, New York City, 1937.

[4] Patterson, Allen D., "Redefining the Values and Functions of Student Teaching," *Nineteenth Yearbook, Supervisors of Student Teaching*, pp. 35-46, 1939.

[5] Snyder, Agnes., "Developing a High School Program on the Basis of the Problems of Rural Living," *Twentieth Yearbook, Supervisors of Student Teaching*, pp. 28-41, 1940.

3. A comparison of the extent to which student-teaching in the ten indicated areas has helped in later teaching according to the reports of high school teachers is made in Table III.

4. Table IV shows a comparison of the emphasis needed on student-teaching activities in the ten different areas according to the opinions of the high school teachers who were included in this investigation.

TABLE I

A COMPARISON OF THE AMOUNT OF ATTENTION GIVEN TO TEN DIFFERENT AREAS OF STUDENT-TEACHING ACTIVITIES IN KANSAS TEACHER-EDUCATION INSTITUTIONS

Areas of Student-Teaching Activities	*Average Rating*
1. The Selection and Organization of Subject matter	75
2. The Selection, Planning, and Application of Methods of Instruction	75
3. Activities Providing for the Personal and Professional Growth of the Teacher	68
4. Understanding and Recognizing Pupil's Interests, Abilities, and Needs	67
5. Teaching Pupils How to Study	66
6. Evaluation of the Achievement of Pupils	65
7. Helping Pupils Build Desirable Personal and Social Habits, Interests, Appreciations, Ideals, and Attitudes	65
8. Activities Involving School and Classroom Routine	60
9. Planning and Participating in Pupils' Extra-Curricular Activities	44
10. Activities Providing for Student Participation in Community Affairs	40

TABLE II

A COMPARISON OF THE DEGREE OF DIFFICULTY OF TEN DIFFERENT AREAS OF STUDENT-TEACHING ACTIVITIES ACCORDING TO THE REPORTS OF HIGH SCHOOL TEACHERS

Areas of Student-Teaching Activities	*Average Rating in Difficulty*
1. The Selection and Organization of Subject Matter	78
2. Understanding and Recognizing Pupil's Abilities, Interests and Needs	78
3. The Selection, Planning and Application of Methods of Instruction	78
4. Evaluation of the Achievement of Pupils	76
5. Teaching Pupils How to Study	72
6. Helping Pupils Build Desirable Personal and Social Habits, Interests, Appreciations, Ideals and Attitudes	69
7. Activities Involving School and Classroom Routine	69
8. Planning and Participating in Pupil's Extra-Curricular Activities	67
9. Activities Providing for Student Participation in Community Affairs	65
10. Activities Providing for the Personal and Professional Growth of the Teacher	61

TABLE III

COMPARISON OF THE EXTENT TO WHICH STUDENT-TEACHING IN THE TEN AREAS HAS HELPED IN LATER TEACHING ACCORDING TO REPORTS OF HIGH SCHOOL TEACHERS

Areas of Student-Teaching Activities	*Average Rating in Extent of Helpfulness*
1. The Selection and Organization of Subject Matter	76
2. Understanding and Recognizing Pupil's Abilities, Interests, and Needs	74
3. The Selection, Planning, and Application of Methods of Instruction	73
4. Evaluation of the Achievement of Pupils	72
5. Teaching Pupils How to Study	69
6. Helping Pupils Build Desirable Personal and Social Habits, Interests, Appreciations, Ideals, and Attitudes	69
7. Activities Involving School and Classroom Routine	68
8. Planning and Participating in Pupils' Extra-Curricular Activities	65
9. Activities Providing for Student Participation in Community Affairs	47
10. Activities Providing for the Personal and Professional Growth of the Teacher	47

TABLE IV

A COMPARISON OF THE EMPHASIS NEEDED ON STUDENT-TEACHING ACTIVITIES IN TEN DIFFERENT AREAS ACCORDING TO THE REPORTS OF HIGH SCHOOL TEACHERS

Areas of Student-Teaching Activities	*Average Rating in Emphasis Needed*
1. The Selection and Organization of Subject Matter	94
2. Understanding and Recognizing Pupils Abilities, Interest, and Needs	93
3. The Selection, Planning, and Application of Methods of Instruction	93
4. The Evaluation of the Achievement of Pupils	92
5. Teaching Pupils How to Study	91
6. Helping Pupils Build Desirable Personal and Social Habits, Interests, Appreciations, Ideals and Attitudes	90
7. Activities Involving School and Classroom Routine	88
8. Planning and Participating in Pupils' Extra-Curricular Activities	88
9. Activities Providing for Student Participation in Community Affairs	83
10. Activities Providing for the Personal and Professional Growth of the Teacher	83

The findings presented in the four preceding tables indicate that subject matter selection and organization, together with the selection, planning and application of methods of instruction received the major part of the emphasis and attention in student-teaching courses in Kansas colleges. Student-teaching activities relating to the personal growth of pupils received secondary emphasis. The relatively low "average rating" of student-teaching activities dealing with the home, extra-curricular activities and the community indicates that in the teacher-education institutions in-

cluded in this investigation "the context of contemporary education" is not moving out rapidly "to include the use of community resources."

Outstanding Student-Teaching Activities, Problems and Difficulties as Reported by High School Teachers

Part II of the questionnaire used in this study included the following questions: (1) In your opinion, what is the one most important thing that prospective teachers should acquire in Practice Teaching? (2) What one activity or phase of your Practice Teaching has proved to be most helpful in your later teaching? (3) What one activity or phase of your Practice Teaching has proved to be least helpful in your later teaching? (4) In your opinion, what one problem in your Practice Teaching seemed most difficult to you?

The important knowledges and skills that prospective high school teachers should acquire in student-teaching courses, as reported in the questionnaire returns, were: understanding high school pupils; learning techniques and methods of teaching; securing self-confidence and poise in teaching; obtaining more experience in selecting, organizing, planning and mastering subject matter; and securing more experience in actual, responsible student-teaching. The activities or phases of student-teaching reported to have proved most helpful in the later teaching of high school teachers were as follows: outlining brief lesson plans; selecting, organizing, and presenting subject matter; actual responsible student-teaching; understanding high school pupils; learning methods of teaching; and observing teaching. The activities or phases of student-teaching reported to have been least helpful in the later teaching of high school teachers were: the making of detailed lesson plans; the more routine aspects of actual student-teaching; methods of teaching; participation and observation; teacher-pupil relations; supervision; and extra-curricular activities and contacts. The most difficult problems reported by high school teachers as encountered in student-teaching included the following: making materials interesting for all groups; planning, organizing and adapting assignments; directing class discussions; presenting lessons to a class; providing for individual differences; making lesson plans; maintaining discipline; maintaining self-confidence and poise before a class; and relationships with supervisors.

Suggestions Made By High School Teachers for the Improvement of Student-Teaching Courses

The suggestions that were made by high school teachers for the improvement of student-teaching courses included (1) ways in which directors and supervisors of student-teaching, classroom teachers, and other instructors could help those enrolled in student-teaching courses, and (2) recommended changes in the student-teaching courses. The suggestions were made in response to questions included in Part II of the questionnaire.

1. According to the reports received in the completed questionnaires, those who are most directly concerned with the direction and supervision of student-teaching should provide assistance and help in the following

areas: constructive criticism, personal conferences, personal interviews, supervision, personal interest in students, and responsible student-teaching. High school teachers reported that supervisors in general were lax in supervision, failed to provide opportunity for sufficient responsible student-teaching, and did not take a genuine interest in student teachers. Instructors in professional educational courses were advised to give more emphasis to the practical aspects of their subjects, to present their lessons more effectively, and to place less emphasis on theory. The suggestions relating to the help that teachers of subject matter courses might give to student-teachers included the following: making teaching more practical, helpful, and interesting; the integration of subject matter fields; the demonstration of good teaching methods; and provision for class discussions.

2. The changes recommended in student-teaching courses were: the provision of more hours of actual teaching by the student teachers; provision for teaching in more than one field or subject; provision of more opportunity for observation of teaching; additional provision for supervision; the improvement of relations between supervisors and student teachers; and the placing of greater emphasis on the practical aspects of student-teaching.

Eighty-six percent of the high school teachers who were included in this study expressed the opinion that student-teaching in more than one subject was necessary. A tabulation of favorable and unfavorable expressions contained in the comments made by the teachers revealed the fact that fifty-nine percent were definitely favorable to the student-teaching courses they had taken, and forty-one percent were unfavorable to such courses.

Conclusions and Recommendations

The following recommendations are based upon the findings made in this study.

1. Laboratory schools and student-teaching courses should be organized to meet the requirements of practical and democratic problems as they are actually experienced by high school teachers in the field.

2. The promotion of cooperative relationships should be a major concern of student-teaching directors and supervisors.

3. Student-teaching experiences and activities should be integrated with professional and subject matter courses. All departments should cooperate in the training of teachers.

4. The scope of student-teaching courses should be expanded to include the out-of-school life of high school students. Student-teachers should receive vital experiences in community living.

5. Student-teaching courses should be organized to provide additional responsible teaching, including some full-day observation and teaching. Opportunity for teaching in more than one field or subject should be provided in teacher-education institutions.

6. Teacher-education programs should make provision for the professional and personal growth of teachers.

EDUCATION AND THE DEMOCRATIC IDEAL IN THE EIGHTEENTH CENTURY, WITH EMPHASIS ON THE CONTRIBUTION OF SWITZERLAND

ETHEL DOUGLAS LOCK

PURPOSE OF THE STUDY

The purpose of this study is to trace the development of the democratic ideal in education in the eighteenth century. The democratic ideal assumes that every individual should have the opportunity to develop his personality to the limit of his potentialities so that he may become a happy, self-sustaining, and contributing member of society. It also assumes that the democratic educational objective is to provide schools for all persons and to insure them instruction for effective living. The basis of this educational objective developed from the credo—formulated by the philosophers of the eighteenth century—that all men are by nature good, equal, and infinitely perfectible. This credo was an irresistible democratizing force in the eighteenth century.

The emphasis in this study is upon the growth of *general* education, involving democratic principles, to include (a) all extensions of education to groups of people not before altogether deprived of its benefits, (b) all improvement in methods and curriculum content, and (c) new type of civic, moral, and vocational education. *Special* education includes (a) extensions of educational opportunity to persons hitherto deprived of it, namely, the deaf, the blind, the feeble-minded, and (b) the improvement in methods and curriculum content.

An excellent reason for studying the eighteenth century is that many of the vital educational problems that disturb the twentieth century and demand solution were recognized by the best thinkers of the eigheenth century. Their solutions of these problems were often as good if not better than our own. The failure of many of their plans at that time resulted not so much from any intrinsic weakness as from the uneven development of the political, economic, and cultural bases of educational development. Many of these plans did not reach fruition in the eighteenth century, but were compelled to await more favorable political and economic conditions in the nineteenth century. The ideas formulated by the philosophers, statesmen, and practical educators of the eighteenth century became the bases of actual school systems of the nineteenth and twentieth centuries.

While Europe is the selected field of this study, Western Europe and Switzerland especially, receive particular attention. Switzerland was a cradle of democracy which had preserved from remote times the form, if not always the substance, of a democratic way of life. From the time of Calvin and Zwingli in the sixteenth century, Switzerland encouraged democracy in other lands by its own striking example, by acting as the teacher for the rest of Europe, and by furnishing, at critical times, asylum for persecuted liberals. From sixteenth century Switzerland, Calvinism spread to

France, Navarre, Holland, Hungary, and America. The Academy of Calvin at Geneva is considered by many as the ancient mother of the great free schools of our times. One of the first requirements of Calvinism, as formulated in the sixteenth century, was elementary education for everybody. Wherever Calvinism spread and became dominant, some form of compulsory education grew. The Swiss, in the eighteenth century, developed a method of attacking their problems so effective and so suitable to their temperament that it is still a part of their way of life. They encouraged a spirit of investigation, of seeking the truth, and then working together to accomplish their purposes. They depended then as they do now upon the freedom of the press and the right of meeting and association. The Swiss today furnish to the world an example of a nation democratically educated and for that reason democratically governed.

Other countries than Switzerland are included in the study for purposes of comparison and completion of the account of the accomplishment of the eighteenth century with respect to the solution of the problem of education and instruction for effective living for all. Only the most outstanding work has been considered, in order to show the amount of progress made in the democratization of education during the century.

The Eighteenth Century Period

The eighteenth century as the term is used in this study was the period from 1715, the end of the age of Louis XIV and the age of seventeenth century absolutism, to the end of the Napoleonic wars and the beginning of the period of restoration and reconstruction.

The European situation at the beginning of the eighteenth century is commonly referred to as the Ancient Regime. It was a cross-section of civilization in all of its phases, which was the product of sixteenth and seventeenth century modifications of the heritage of modern Europe. It was a peculiar mixture of old and new ideas, institutions, and customs in force in Western Europe before the revolutions of the eighteenth century, and was found most typically in Bourbon France. In spite of diversity of conditions in different countries, there were conditions common to life in all countries.

Men everywhere were socially grouped in a hierarchy of rigid classes, each having its own special conventions and distinctions. The populations were essentially rural and agricultural. The rural inhabitants were lords and peasants. Only in rural England was there a middle class. Serfdom existed in many places. In the small countries of Central and Southern Europe feudalism was still a stern reality. There were serfs in France, most of them in Franche-Comté and Alsace, Germanic provinces only lately acquired. The lot of the peasant east of the Elbe especially in Prussia, Pomerania, and Mecklenburg, was virtual serfdom. The peasant of France was better off than the peasant of Germany, Italy, or Spain; but the English peasant was better off than the peasant of France.

The countries of Europe lived under a regimented economy. The governments which were generally unenlightened despotisms, controlled eco-

nomic life so as to insure a balance of trade and enough money to carry on their wars. The power of absolutist monarchy was limited in England by a Parliament elected upon a narrow electoral base, and in France by the parlements, the privileged classes, and the self-interest of the provincial assemblies. In international relations, the power balance system dominated world affairs.

Religion in the eighteenth century was dominated by the forms and dogmas of the church. The state abetted the church in punishing severely any irregularities in ideas or conduct. Cultural life was formal and conventional. Education was mainly in the hands of the church and was governed by traditional, authoritarian methods, and over-balanced with religious content. All phases of life under the Ancient Regime were characterized by absolutism. In all departments unreason, inconsistency, inequality, inefficiency, and insincerity were to be found. Reform was needed in all of the conditions of life. It was the mission of the eighteenth century to modify the Ancient Regime and evolve a new order.

The forces which contributed to these changes were the "Cultural Enlightenment," the "Religious Awakening," the economic revamping, the social equalitarian movement, political revolutions, and the breaking of the power balance. The forerunner of all of the movements was the "Enlightenment." Its viewpoint was secular, with an appeal to reason rather than to authority. It was kindled by John Locke in England, taken up by Voltaire in France, Wolff in Germany, and by many others. The movement contributed to the cultural and spiritual revivals; the economic changes known as the agrarian and industrial revolutions; theoretical equality and actual humanitarianism; political enlightened despotism; and popular revolutions.

Early Representatives of Educational Progress

Just as the reign of decadent, unenlightened despotism gave way before the progress of enlightenment and was followed by a period of enlightened despotism, so the traditional, authoritarian educational system of the past two centuries began in the eighteenth century to be revised according to new scientific and philosophical ideas. The most important of these ideas were the principles of John Locke, Montesquieu, Beccaria, and Rousseau. In practically all of its phases, however, the reconstructive ideas pivoted upon the dynamic views of John Locke. Although he is called the "Father" of the British empirical philosophy, he was indebted for many of his ideas to men who had gone before him. For his educational views he owed the greatest debt to the Czech educator, Comenius. Locke proposed dependence upon the senses rather than upon authority as the basis for education. He believed that men are what they are because of their education, and that it was education alone that made the vast difference in them. He emphasized the importance of childhood training based on study of the child's nature and aptitudes. He believed that the activity and curiosity of the child should be used to motivate his studies, and that an appeal should be made at all times to his reason.

The followers of Locke on the continent disseminated his ideas by their writings, and by their labor contributed to the practical application of them in school and society. Prominent among these disciples of Locke were Béat-Louis de Muralt in French Switzerland, J. J. Bodmer in German Switzerland, and the Encyclopedists led by Voltaire in France. The Encyclopedists, of whom the most prominent after Voltaire were Denis Diderot and d'Alembert, led the criticism of existing educational institutions, wrote school plans for the enlightened despots and contributed to changes in educational thought and practice. It was the Genevan, Jean-Jacques Rousseau, who exerted the greatest influence on his own and later times. His influence extended beyond philosophy to politics and educational thought. He disavowed the idea of original sin and insisted that all evil comes from society. He believed that civilization had betrayed the "natural man" and that it was necessary that he be reconstructed by means of education. He popularized the ideas of the natural goodness of man and his infinite perfectibility. Man who was essentially good could achieve happiness through education. This was the faith of the revolutionary leaders. Education must be secularized and its privileges extended to all, even to the under-privileged members of society. Under the impetus of these ideas, elaborate plans for complete and national educational systems were made in France, Switzerland, and other countries of Europe. These plans called for revision of the curriculum, methods, and materials of instruction. Education was to be more practical and adapted to the demands of everyday life. It must be consistent with nature and follow the empirical methods of science. Programs for the training of teachers were included in the plans.

Switzerland the Forerunner

Nowhere in Europe was greater interest shown in the improvement of education and its extension to the people than in the Swiss Confederation. Nowhere was greater consecration to the cause of the regeneration of humanity through the processes of education shown than by the Swiss Patriots of the eighteenth century. From the beginning to the end of the century they conducted a laboratory of education for democracy.

Conditions in Switzerland at the beginning of the eighteenth century were unfavorable to improvement in education. Inflexible social structure, faulty economic development, and a backward educational system were barriers to the forward march of the people. The ignorance of the lower classes was systematically promoted as a means of keeping them from becoming restless. A rigorous control of the lives of the people was exerted by state and church authorities. Anything that displeased the powers in control was censured or suppressed. Means of disseminating knowledge to the lower classes of society were few because of illiteracy and lack of literature. The gap between the literary language and the generally used patois was another handicap.

The weakness of the educational system in all of the cantons at that time is readily apparent. Superior schools for the upper classes were numerous and good for the time, but everywhere the education of the common people was neglected. The material side of the school program was of more

concern than the intellectual and the moral. The quality of the educational offering depended upon the initiative of the communes. Schoolhouses were few, the masters inferior, the curriculum meager, the work predominantly memorization. There were no adequate facilities for training teachers and the materials of instruction were meager.

Among the most progressive thinkers there was a growing desire to promote the welfare of all men. Progressive ideas were taking root in the University of Basle and in the academies where there were a number of able men. There was also a growing spirit of progress among the better citizens. As wealth accumulated and enlightenment spread, individuals, societies, and governmental agencies interested themselves in improving the conditions of life in Switzerland by establishing libraries, agricultural societies, welfare societies, by sporadic attempts to improve the educational situation, and by increasing the means of disseminating knowledge among the people. What the public neglected public-spirited individuals often tried to do. Thus the public was able by its own efforts to develop a cultural democracy long before political democracy was possible.

As might be expected, the centers of protest against the evils of the old regime and the call to a new order were the University of Basle, and the Academies of Berne, Zurich, Geneva, and Lausanne. The evils against which they protested were: (1) a narrow patriciate which deprived the common man of any participation in the government and thus deprived him of the opportunity of training for citizenship and of equality of economic and political privileges; (2) a cultural background of ignorance and superstition for the common people, which resulted in intellectual apathy of the lower orders of society; (3) economic inequalities which gave a disproportionate amount of this world's goods to the upper classes and so deprived the lower classes that they were unable to do anything for society; (4) a backward educational system which provided the only educational opportunity open to the common people; (5) a divided religious allegiance which weakened the old Confederation and hindered that unity of the people so necessary to the development of sentiments of patriotism; (6) narrow-mindedness and bigotry in religion and government that greatly restricted the freedom of the people and prevented their proper development.

At first much of the work of reform was done by individuals and consisted of criticism, stimulation of the activity of others, and provision of materials of instruction. Gradually the Swiss learned the power of concerted effort when applied to civic and educational problems and many societies were formed to work for the betterment of man and his environment. While not the first, the greatest of these was the Helvetic Society of Schinznach (1762). This originated in the fertile brain of the old Swiss patriot of Lucerne, François-Urs Balthasar, and was successfully promoted by the leading citizen of Basle, Isaac Iselin, and his intimate friends. Societies in imitation of the Helvetic Society were founded over all of Switzerland and carried on a vigorous campaign of reform up to the hour of the Helvetic Revolution (1798). The work of the societies especially in dis-

semination of knowledge was abbetted by the salons which flourished in French Switzerland.

The program of the societies was to attempt to create an appreciation of the glorious past of Switzerland, to study its present condition and future possibilities, to improve the laws and customs, to improve the condition of agriculture, to promote the welfare of the people and to found scientific, charitable, and educational institutions. They undertook to inculcate in the younger generation a purer and more democratic ideal of living. The chief concern of the leaders of the societies was to insure *better popular instruction*. The methods used by the societies to further their aims were use of the press and speech, and the individual and concerted action of the members.

One of the most important experiences of the period 1762-1790 was the agricultural and industrial experiment of Pestalozzi at Neulof in 1774-1775. This industrial school for the poor where mental, moral, and vocational instruction were inter-mingled, was the forerunner of hundreds of its kind on both sides of the Atlantic. Pestalozzi was convinced that it was the turmoil and the irregularity in the lives of the children of the poor, in addition to the excesses in which they indulged, their rebellious passions, and their hopelessness, that retarded their development. He believed that if the disquieting influences were removed and a proper diet were provided the children would soon regain their health and spirits. He found it possible to make the children grow on a simple diet of bread and vegetables. He believed the feeble-minded could be saved if given proper care. Pestalozzi's practical experiment furnished a model for the school of Fellenberg at Hofwyl, for agricultural colleges in America, and for French agricultural colonies of the nineteenth century.

Pestalozzi believed that moral education was the only preventive of crime. His suggested penal reforms and prison discipline and his educational reforms influenced the enlightened despots, especially Joseph II and Leopold II of Austria.

Much was done in the period from 1715-1790 to improve the superior schools of Switzerland, to broaden the curriculum, to improve methods, and to open educational opportunity of a vocational nature; but elementary education was still much neglected. Leaders began to see that the only solution for their problem of giving the Swiss an educational opportunity suitable for all citizens was to create a national, universal, and compulsory system of education.

The most comprehensive of the plans developed to promote this aim was offered to the government of the Helvetic Republic by its Minister of Arts and Sciences, Philippe-Albert Stapfer. It was a plan so progressive in many respects as to be one hundred years ahead of its time. It included *obligatory primary instruction* free to the poor, numerous secondary establishments, a federal university, a federal normal school, a Council of Education of eight members in each canton to conduct the schools independ-

ently of the Church, and inspectors in each district. Government aid was to be given to parents who could not feed and clothe their children.

A modern curriculum was included in Stapfer's plan, which also proposed a free play type of physical training, military training, physical inspection, health education, and civic and moral instruction. Field trips were to be made to industries to give a knowledge of useful arts. Manual arts were to be taught. These privileges were to be extended to children of the country as well as to those of the town.

Stapfer's aim was to give the pupils necessary knowledge, acquaint them with their duties, develop physical and intellectual abilities, perfect them for a career and inspire them with a love for truth and republican principles. It failed because of lack of funds and the disorder of the times; but it was the basis of all future Swiss plans for education. Dr. Luginbuhl, biographer of Stapfer, values the five years of the Helvetic Republic and Stapfer's ministry on a par with the gains of the five preceding centuries.

The outstanding educational experiments of the period of Mediation were the institute of Pestalozzi at Yverdon and the Agricultural school of Fellenburg at Hofwyl. From these schools the most progressive principles of the eighteenth century spread to Germany and from Germany to the rest of the world.

Switzerland has never lost the work of the eighteenth century. The approach to every problem of life was educational. The greatest statesman in the light of his approach to life was Heinrich Pestalozzi. Their most dominating loyalty was to democracy. More to them than a form of government, democracy was a way of life. The will to national life, the community of effort, and their enlightened educational policies made the Swiss one of the most democratic peoples in the world.

Schools in France

While Switzerland was working out her problems other nations had been attempting the solution of their own. In most of the countries the control of education was mainly in the hands of the Church. This condition continued to a greater or less degree until the expulsion of the Jesuits in 1762-1777. All countries were changed by the spread of the Enlightenment, and the philosophers, its prophets, aided in the making of school plans.

In France in the early part of the century schools were numerous but unequally distributed, with many more in the North and East than in the Center and South. This condition had existed for two centuries and was to continue through the eighteenth and into the nineteenth century. The clergy supervised the school in moral education. The primary schools were the product of local initiative and support. The state co-operated with local and church authorities but intervened little except to see that masters were appointed and paid. The bishops had much more influence than the state over educational matters.

France was well supplied with schools of secondary and higher rank. There were twenty-one universities, forty-nine academies, seventy-four

special and professional schools, and the College of France. Schools had been established throughout France by towns, religious communities, and private and philanthropic enterprise, but the philosophers and statesmen considered a system so unevenly distributed inadequate and demanded a national system of education. In order to be truly national such a system must of necessity be secular, which required the expulsion of the Jesuits. From the expulsion of the Order of 1762 to the close of the period of the Revolution, the problem of the French was to find a plan to fill the gap left in the educational system. The King called for plans. Among the first and most important was that of La Chalotais, who urged a form of universal education which would teach the moral virtues and political principles necessary for everyday life. The most useful knowledges and those which elevate the spirit should be cultivated. He advocated similar education of boys and girls and the employment of the scientific method of instruction.

La Chalotais' plan was important because it provided the main principles upon which later plans and the modern French educational system were based. It was followed by many others, among them the plan of Turgot to change the entire French nation in ten years by a national system of education. The men of France, as the men of Switzerland, hoped to regenerate their people by education. Especially enlightened was their idea that adequate education of women was a national necessity, and that defectives needed more attention than the more privileged of society.

The story of the French Revolution may be divided into three phases in respect to its influence on the schools. The first period, 1789-1793, was characterized by decentralization. In that time many plans were proposed for the improvement of primary instruction. The second period, 1793-1794, was one of centralization and promulgation of decrees. From 1794 on, the tendencies toward centralization and decentralization were mixed in their influence. An effort was made to apply the laws but the results were poor.

The chief demand was for a national system of civic and lay moral education for all. Man must be taught his rights and his duties as a citizen. The usual means suggested was to teach him the Constitution. Education was to be for effective living. The vernacular was to be used in all branches of study and science and history were to go hand in hand to enlighten the world.

Ideas and plans were abundant, the most important being those of Condorcet and Daunou. Condorcet's emphasis was upon experimentation and an objective philosophical outlook. He expected to create a paradise on earth by the perfection of human beings. His plan included five degrees of education including primary and secondary schools, institutes, lycées, and a National Society of Sciences and Arts. All of the leaders were agreed that education should be unified and universal.

The gains for education in the Revolutionary period were mainly theoretical, but practical results ultimately came from them. A new viewpoint was gained which became the philosophical basis of the modern French

Educational system. Scholastic methods were discarded. Permanent gains were the use of the vernacular, the emphasis on natural and social sciences, recognition of the need for civic and moral instruction, the use of the experimental method, and the recognition of the right of all citizens to educational opportunities.

The governmental efforts of the period from 1795-1815 produced much less for actual primary instruction than they destroyed. The primary schools were left to private and communal initiative until 1833. Napoleon established normal schools for the training of primary teachers and a fine secondary school system under the control of the university. This furnished the basis for the secondary schools of the nineteenth century, which Matthew Arnold praised as a democratizing force in French society.

Elsewhere in Europe improvements were made involving extensions of educational opportunity and improvement of curriculum and methods. In England something approximately a national system of education grew out of the Church society movement. German universities, especially Halle and Göttingen, were leaders for freedom of thought and teaching. They emphasized the experimental methods of science. The seminar method was used at the universities of Halle, Göttingen, and Berlin. Prussia adopted Pestalozzian principles into a state system of education which the western world envied and imitated. In all of the countries of Western Europe enlightened efforts for improvement of the educational opportunity of the people were made by governments, by individuals, and by groups of individuals motivated by humanitarian ideals.

The spirit of the eighteenth century found expression in practical humanitarian work with all handicapped members of society. New methods came with the extension of educational opportunity and the expansion of the curriculum. Everywhere leaders expected national progress to come from education of the people. The belief in the importance of the individual resulted in the study of the child by genetic methods; and with the study of the child came the milder discipline that had been advocated by Locke, Rousseau, and Pestalozzi.

The eighteenth century shows that for the progress of the people, enlightened leadership and the spirit of cooperation are necessary; that without education, social advancement is impossible; that the democratic education of youth should not be left to chance; that democratic education is essential to a democracy. From Pestalozzi, leading statesman of the Swiss, we learn that "Without political training, the sovereign folk is a child, who plays with the fire, and sets the house in danger every moment."

A STUDY OF THE TRENDS OF ATTITUDES TOWARDS MUSIC IN SCHOOL CHILDREN

E. THAYER GASTON

THE PROBLEM

One of the chief aims of music education is to bring about desirable attitudes on the part of the pupils toward the music with which they come in contact. This study seeks to discover the polarity and strength of the attitudes, their genetic trends, their similarities and common characteristics, and to indicate the relative influence of certain factors in their development.

THE NATURE AND IMPORTANCE OF ATTITUDES

According to Allport, "An attitude is a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related."[1]

An attitude characteristically facilitates behavior that is favorable or unfavorable toward that to which it is related. The importance of attitudes in relation to education is obvious when it is realized that attitudes determine the individuals enjoyment of present day culture and the types of his relationships with his fellowman.

In the past the musician performing first-hand for the listener had much to do with the attitudes of his listeners. Such is not the case to-day. Sound film, radio, and phonograph reproduction have become potent factors in the development of the child's attitude toward music. It becomes, therefore, the duty of the schools to provide the child with the essentials of positive attitudes toward those musical values which are and will be of greatest worth to the child.

That the schools are succeeding somewhat is to be admitted, but there is a gap between the child's musical experience in the schools and his musical experience outside of the schools. This gap is often so great that the child thinks of school music as one thing and the rest of music as something else. School music is too cluttered up with skills for which the child sees no meaning. Often the school isolates itself from life by refusing to recognize the outside musical experience of the child. Certain attitudes will develop from conditions such as these. When the whole field of music education has for one of its major goals the development of positive attitudes toward music, the complacency as to the type of attitudes being developed is amazing.

THE PURPOSE OF THIS STUDY

The purpose of this study is to answer the following questions as specifically as possible:

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[1] Allport, G. W. "Attitudes," in *Handbook of Social Psychology* (Carl Murchison, editor) Worcester, Mass., Clark University Press, 1935. pp. 798-844.

1. What are some of the attitudes of school children toward various phases of their musical experience?

2. Which of these attitudes are positive, which are negative, and in what degree?

3. Do any trends in attitudes appear as the pupil passes from grade to grade?

4. What is the direction and strength of these trends?

5. Which attitudes exhibit similarities in the seventh grade?

6. What is the relation of the following factors to the child's attitude toward music: (a) Music in the home; (b) Musical equipment and organization in the school; (c) Methods and aims of the music teachers; (d) The intelligence level of the child; (e) The scholastic record of the child in music.

Materials and Subjects

In a representative town of some 15,000 population the musical attitudes of grade school and junior high school pupils were secured by having them write letters to the principals of their respective schools. In these letters the pupils listed their "likes" and their "dislikes" regarding their musical experiences both in and out of school. From frequency tabulations of these "likes" and "dislikes" an attitude scale of forty items was developed. Each item was weighed and labeled as follows:

I like very much	5	"very positive"
I like	4	"positive"
Undecided	3	"neutral"
I dislike	2	"negative"
I dislike very much	1	"very negative"

The validity of the scale is based on the assumption that verbal declarations tend to be indirect indications of dispositions toward overt action. A preliminary test of the reliability of the scale yielded a correlation of .92 by the odd-even method.

The following scales were devised to measure assumed factors in the development of the attitudes of children toward phases of their musical experience: (a) Home Musical Influence; (b) School Organization and Equipment; (c) Methods and Aims of Music Teachers.

The validity and reliability of these scales are unknown, but in spite of this the importance of the factors they were designed to measure seemed so great as to make essential some attempt at their measurement. There were no similar scales of known reliability and validity.

A rating of the musical scholarship of each child was secured in numerical form from the respective teachers. Although many studies show little relationship between intelligence and attitude, the intelligence ratings and mental ages of a majority of the subjects were secured.

Ten Kansas schools of varying size, having a combined elementary enrollment of 17,492, were selected as representative of average school situ-

ations. A total of five hundred subjects were selected as follows. Ten pupils were chosen at random from each of the following grades: third, fourth, fifth, sixth and seventh from one elementary school from each of the ten school systems. All of the schools had music supervisors and the movable "Do" system was the basic tool for the reading of music.

Preliminary Study

Throughout the history of public school music, music teachers have devoted much effort toward the development of methods of bringing about musical literacy on the part of their pupils. None of these methods have been successful with a majority of the pupils. The problem of developing musical literacy is still one of the chief stumbling-blocks in public school music. Solfeggio is the common method in use at the present time. Its success is dependent upon the association of tonal patterns with a system of intoned syllables, do, re, mi, fa, sol, la, ti.

In order to present objective evidence of the success of solfeggio as a method of developing pupil ability to read music the following preliminary study was carried out.

Two-hundred fifty high school students were selected at random from ten representative schools having a total high school enrollment of 8,780. All two-hundred fifty subjects had had at least six years of music instruction in the lower grades. This instruction was based on solfeggio as a method of reading music.

The subjects chosen were asked to report one at a time to a designated room. There they were given a blank to fill out. They were informed one at a time as to their part in the study. Table I summarizes the information obtained from the 250 blanks.

TABLE I

SUBJECTS, THEIR MUSIC PARTICIPATION AND PREVIOUS OPINION OF SYLLABLES

	Number of Subjects Participating
Girls	136
Boys	114
Subjects in vocal organizations	89
Subjects in instrumental organizations	51
Subjects who had studied or played some instrument	176
Subjects now playing some instrument	117
Subjects who belonged to some musical organization not named above	10
Homes of subjects in which instruments were available	192
Subjects who liked syllables in the grades	114
Subjects who disliked syllables in the grades	131
Subjects giving no opinion on syllables	5

Phonograph recording equipment, with a portable microphone was used to record the sight-reading attempts of the 250 students.*

* The Continental Music Company, Inc., of Chicago loaned complete equipment for use in this study.

Each subject was told that no grade was to be given on his attempt to sight-read and that the recording had nothing to do with his school work. Each subject was given the pitch and a chance to practice the song once through, and told that he might sing it any way he wished. He could sing the words, hum, use neutral syllables, or he could use the syllables do, re, mi, etc. He was then reminded that he had been taught these syllables to help him read music. He was asked if he understood and even if he said "yes," the entire explanation was again made and the function of solfeggio emphasized.

The material to be sight-read was selected from a widely used public school music series.[2] The fourth book of this series is commonly used in the fifth grade. Five "Reading" songs were chosen from the first part of the book which is a review of the fourth grade level. Each subject was allowed to select one of the five songs to sight-read.

Each subject was told that his voice would be played back to him as soon as the recording of the attempt was finished. That high school student would be rare who had the ability to sight-read music and deliberately faked the attempt the first time his voice was recorded individually. Every effort was made to allay nervousness. From time to time supervisors were asked to witness the procedure and they volunteered the information that the routine followed was fair in every way to the subjects.

The results are very clean cut and significant:

Not one high school student was able to sight-read correctly music which fifth grade pupils are being asked to sight-read. Not one of the

TABLE II

PUPILS AND EXPRESSED ATTITUDES

Grade	*Number of subjects who wrote letters*	*Number of different statements per grade*	*"Likes"*	*"Dislikes"*	*Frequency of Statements*
5 & 6	81	166	101	65	1,360
7	196	153	102	51	1,867
8	174	110	72	38	1,812
9	169	128	76	52	1,664
Total	620	557	351	206	6,703

Total number of different statements by the 620 pupils.

Positive	164
Negative	103
Total	267

[2] McConathy, O., Miessner, W. O. and others. *The Music Hour*, Fourth Book, New York: Silver, Burdett and Co., 1929.

students would use syllables (do, re, mi, etc.) which, for at least five years, he had been taught to use.

Attitudes Toward Music

Reference has been made to the letters written by the pupils, containing many of their "likes" and "dislikes" toward music. Table II shows by grade the students participating and the number of attitudes expressed.

Table III shows the twenty positive attitudes having the highest frequencies for the entire group, and Table IV shows the twenty negative attitudes having the highest frequencies for the entire group. The Attitude Scale was made up of these forty items.

TABLE III

TWENTY POSITIVE ATTITUDES HAVING THE HIGHEST FREQUENCIES

Attitudes	*Frequencies*
1. Popular music	436
2. Band music	386
3. Radio music	349
4. Words rather than syllables in songs	257
5. To whistle	225
6. Picture show music	210
7. Symphony orchestras	181
8. Phonograph music	167
9. Group singing	153
10. Violin music	151
11. To sing folk songs	147
12. Popular orchestras	90
13. Most music	87
14. Piano music	72
15. Music in grade school	65
16. To keep time to music	63
17. To learn about famous musicians	60
18. Swing music	57
19. To sing	57
20. Drum music	54

The attitude score of each individual is the sum of his scores on the forty items of the Attitude Scale. Each item may have any one of five different values, depending upon the attitude evinced, as shown above under "Materials and Subjects." The mean attitude score for each grade and sex of the 500 subjects is shown in Table V. The mean score for the girls is higher than that of the boys in the third grade and gains slightly with each successive grade until the seventh, when it suddenly drops to a new low. The boys score drops consistently for each grade with the greatest decrease in the seventh. The average score drops about eleven points from the third to the seventh grade.

TABLE IV

TWENTY NEGATIVE ATTITUDES HAVING THE HIGHEST FREQUENCIES

Attitudes	Frequencies
1. To sing alone in front of the class	245
2. Syllables	208
3. To name pitch names of notes	145
4. To sing scales	143
5. To write or copy music	133
6. To count out notes or rests	117
7. To learn about famous musicians	115
8. To explain time signatures	109
9. To name notes flatted or sharped in a key signature	100
10. Violin music	91
11. Symphony orchestras	75
12. To name key signatures	70
13. The way music is taught in the grades	62
14. To sight-read vocal music	57
15. Jitterbug and jazz music	56
16. Opera music	43
17. Group singing	40
18. To keep time to music	35
19. Folk music	34
20. To sing alone	25

TABLE V

MEAN ATTITUDE SCORES

Grade	No. of Girls	Mean for Girls	No. of Boys	Mean for Boys	Total	Mean for Both
3rd	49	165.12	51	158.41	100	161.77
4th	50	166.21	50	158.16	100	162.19
5th	52	167.09	48	152.25	100	159.67
6th	53	168.77	47	150.89	100	159.83
7th	61	158.80	39	142.76	100	150.78
Total	265 Girls		235 Boys		500	

After the score for each of the 500 subjects was obtained, the reliability of the Attitude Scale for the entire group was computed by the odd-even method and found to be .90.

Table VI shows the mean score of each item by grade of the 500 subjects. The mean score of all the subjects in the third grade is shown on the left-hand side of the page under "3" under "Grades." The other scores are shown in a similar manner. In the right-hand column headed "Gain or Loss," "Gain" from the third to the seventh grade is indicated by a plus sign and "Loss," by a minus sign.

TABLE VI

MEAN ATTITUDE SCORE OF EACH ITEM BY GRADE
FOR BOYS AND GIRLS TOGETHER

Item	Grades					Gain or Loss
	3	4	5	6	7	
To listen to popular music	4.39	4.64	4.57	4.68	4.69	+.30
To sing alone in front of the class	3.21	3.01	2.86	2.34	2.42	−.79
To listen to band music	4.61	4.66	4.55	4.65	4.54	−.07
To sing words instead of the syllables in a song	3.99	4.23	4.34	4.39	4.23	+.24
To write or copy music	3.78	3.90	3.44	3.26	3.06	−.72
To listen to music on the radio	4.69	4.71	4.75	4.80	4.81	+.12
To tell where "do" is on the staff	3.55	3.77	3.31	3.59	3.05	−.50
To "count out" notes and rests	3.08	3.44	2.92	3.10	2.78	−.30
To whistle tunes	4.28	4.48	4.49	4.54	4.41	+.13
To sing scales	3.75	3.93	3.65	3.46	2.78	−.97
To listen to picture show music	4.32	4.34	4.15	4.65	4.37	+.05
To listen to music on the phonograph	4.52	4.49	4.43	4.39	4.05	−.47
To name the "letter" names of notes	3.29	3.45	3.27	3.23	3.03	−.26
To learn about famous musicians	4.26	4.27	4.21	4.06	3.76	−.50
To sing songs with my classmates and friends	4.39	4.55	4.55	4.49	4.46	+.07
To name flats and sharps in a key signature	3.10	3.19	3.01	3.29	2.88	−.22
To listen to violin music	4.17	3.67	3.77	3.45	3.49	−.68
To listen to symphony orchestra music	4.09	4.23	3.95	4.32	3.78	−.31
To sing Sunday school and church music	4.42	4.67	4.47	4.51	4.12	−.30
To sight-read vocal music	3.30	3.04	2.89	2.96	2.71	−.59
To sing folk songs	4.41	4.46	4.61	4.50	4.31	−.10
To listen to piano music	4.58	4.50	4.41	4.48	4.46	−.12
To march to music	4.33	4.49	4.45	4.47	4.08	−.25
To use syllables part of the time	3.53	3.56	3.59	3.43	3.11	−.42
To play some musical instrument	4.48	4.55	4.55	4.55	4.50	+.02
To listen to "swing" music	4.41	4.43	4.44	4.41	4.58	+.17
To sing by myself	3.93	4.12	4.28	4.58	4.10	+.17
To listen to accordion music	4.31	4.54	4.44	4.50	4.10	−.21
To sing in operettas	3.95	3.63	3.60	3.76	3.35	−.60
To listen to opera music	3.73	3.48	3.35	3.16	2.79	−.94
To sing cowboy songs	4.55	4.40	4.44	3.89	3.94	−.61
To sing or play lively (fast) music	4.03	4.38	4.57	4.39	4.46	+.43
To learn a song by having the teacher sing it for us	4.11	3.98	4.00	3.96	3.62	−.49
My school music	4.44	4.37	4.32	4.27	4.01	−.43
To tap dance	3.37	3.62	3.34	3.43	3.21	−.16
To sing or play slow music	3.52	3.36	3.29	3.40	3.23	−.29
To play musical games	4.19	4.16	4.23	4.09	3.76	−.43
To have more time every day for our school music	4.25	4.08	4.08	4.16	3.94	−.31
To learn special songs about Christmas, Thanksgiving, Easter, etc.	4.39	4.48	4.59	4.49	4.12	−.27
To be a musician	3.68	3.90	3.32	3.72	3.75	+.07

Similarities and Characteristics of Attitudes

It would seem that consideration of the similarities and characteristics of both positive and negative attitudes constitutes one of the most important phases of this study. If these qualities of attitudes can be discovered, then they may become a sort of measuring stick by which methods and practices in music education can be evaluated. Table VII shows the classification of attitudes in the seventh grade, grouped according to polarity and strength. Other similarities and characteristics will be discussed in another place.

TABLE VII

CLASSIFICATION OF ATTITUDES IN THE SEVENTH GRADE

Class 5. "Very Positive" 4.19-5.00
1. To listen to popular music
3. To listen to band music
4. To sing words instead of the syllables (do, re, mi, etc.) in a song
6. To listen to music on the radio
9. To whistle tunes
11. To listen to picture show music
15. To sing songs with my classmates and friends
21. To sing folk songs
22. To listen to piano music
25. To play some musical instrument
26. To listen to "swing"
32. To sing or play lively (fast) music
Class 4. "Positive" 3.40-4.19
12. To listen to music on the phonograph
14. To learn about famous musicians
17. To listen to violin music
18. To listen to symphony orchestra music
19. To sing Sunday school and church music
23. To march to music
27. To sing by myself
28. To listen to accordion music
31. To sing cowboy songs
33. To learn a song by having the teacher sing it for us
34. My school music
37. To play musical games
38. To have more time every day for our school music
39. To learn special songs about Christmas, Thanksgiving, Easter, etc.
40. To be a musician
Class 3. "Neutral" 2.60-3.39
5. To write or copy music
7. To tell where "do" is on the staff
8. To "count out" notes or rests
10. To sing scales
13. To name the "letter" names of notes
16. To name the flats or sharps in a key signature
20. To sight-read vocal music
24. To use syllables part of the time
29. To sing in operettas

30. To listen to opera music
35. To tap dance
36. To sing or play slow music

Cass 2. "Negative" 1.80-2.59

2. To sing alone in front of the class

Factors Related to the Development of Attitudes

The schools from which the subjects were drawn are located in average Kansas towns, with the exception of School "A," which is in a city. The general uniformity of schools and communities is indicated by the small range of the mean scores of the different schools for each of the measures secured. Table VIII shows the mean score of each measure for each school. It was impossible to get intelligence ratings from School "D."

TABLE VIII

THE MEAN SCORE OF EACH MEASURE FOR EACH SCHOOL

School	Attitude Scale	Home Musical Influence	I.Q.	Musical Scholarship	Organization and Equipment	Teaching Method and Aim
A	165.42	27.50	106.50	88.92	39	91.80
B	158.88	30.50	109.42	89.10	108	97.17
C	162.48	31.04	108.10	87.10	84	93.00
D	162.28	33.26		91.02	90	96.57
E	164.96	29.98	110.92	91.20	75	100.00
F	159.32	26.36	105.15	87.40	101	96.00
G	154.96	26.12	103.37	89.38	91	90.83
H	154.30	28.08	111.74	87.04	134	89.00
I	153.24	26.74	108.08	91.86	55	98.00
J	160.66	31.60	107.57	91.00	88	98.00
All Schools Together	159.45	29.12	108.08	89.40	86.50	95.04
S D	21.09	10.72	13.56	5.38	13.19	3.43

The Relationship of the Factors Measured With Attitude

The chief interest of this study is centered on the development of the attitudes of children toward the various phases of their musical experience. Consequently it is essential to know something of the relative importance of the assumed significant factors in this development. The exact relationships, in so far as methods of correlation show exact relationships remain to be presented. The first series of relationships to be shown, as represented by coefficients of correlation calculated by the "product moment method," are those relationships existing between "attitude toward music" and each of the other factors. Table IX shows these relationships and the number of pairs of measures involved in the correlation.

TABLE IX

CORRELATIONS BETWEEN SCORES OF THE ATTITUDE SCALE AND SCORES OF EACH OF THE OTHER VARIABLES

Attitude and	*r*	*N*
School Organization and Equipment	−.171±.150	10
Teaching Method and Aim	.354±.185	10
Otis Intelligence Test	.124±.032	322
Henmon-Nelson Intelligence Test	.054±.042	100
Home Musical Influence	.363±.026	500
Mental Age	−.064±.043	237
Musical Scholarship	.391±.025	500

The only two reliable correlations presented in Table IX are those between Attitude and Home Musical Influence, and between Attitude and Musical Scholarship.

Additional findings are presented in Tables X and XI. All of the correlations in these two tables are reliable and indicate a significant and definite relationship of marked strength between the factors as indicated in the tables.

TABLE X

CORRELATIONS BETWEEN SCHOLASTIC RATINGS AND SEVERAL OTHER VARIABLES

Musical Scholarship and	*r*	*N*
Otis Intelligence Test	.499±.028	322
Henmon-Nelson Intelligence Test	.487±.072	100
Mental Age	.456±.034	237
Home Musical Influence Scale	.398±.025	500

TABLE XI

CORRELATIONS BETWEEN HOME MUSICAL INFLUENCE AND INTELLIGENCE

Home Musical Influence and	*r*	*N*
Otis Intelligence Test	.303±.034	322
Mental Age	.275±.040	237

Interpretation of the Data

The interpretation of the data of this study will be presented in the light of three principles regarded by the writer as basic to the development of proper attitudes and aims in music education.

First: *If children are to like music, the positive emotional value of the music must remain intact for the children.* The very existence of music de-

pends upon the development of positive attitudes toward it. Music is distinctly subjective and its appeal is primarily emotional. Consequently, if this positive emotional value does not remain intact for the child, then the basic appeal of music is lost.

Second: *If a positive attitude toward school music is to be developed, then school music must maintain contact in a dynamic fashion with extra-school music.* The school should contribute to the extra-school life of the child in such a manner that the school and outside life are integrated and harmonized for him. If, for the child, the music of the school is isolated from extra-school music, then the child will tend more and more to seek extra-school music. This is especially true at the present time when music outside of the school is of high valence and easy accessibility.

Third: *If skills, insights, or appreciations are to be intelligently used, then intelligence must play a part in their acquisition.* The education of the child is greatly facilitated if he realizes his needs and can take an intelligent part in their satisfaction. It is vitally essential, however, if intelligence is to play a part in the satisfaction of the child's musical needs that the materials and problems be of such a nature and level of difficulty that the child can develop insight and thereby deal intelligently with these materials and problems.

The common method of using solfeggio or syllables in the lower grades violates all three of the foregoing principles. The use of syllables does not keep intact the positive emotional value of the music; syllables are not used in extra-school life in reading music; intelligence plays little or no part in the attempted acquisition of syllables. Children are trained to use syllables. They can see little need for them, and their usage so breaks down the music that positive emotional value is lost. To the best of the student's knowledge, no one but the music teacher uses syllables. They, therefore, become for the child an irritation which takes the joy out of singing, and a useless activity which has no outside uses. In view of this it is small wonder that all 250 subjects of the preliminary study refused to attempt to use syllables, this tool, solfeggio, which their teachers had attempted to teach them for five years. Of greater significance was the failure of all 250 high school subjects to read fifth grade music. This was undoubtedly due in part, to the acquired negative attitude toward sight-reading music.

Attitudes Elicited from the Attitude Scale

Before discussing the attitudes elicited by the Attitude Scale it is necessary to call attention to the matter of individual and sex differences. They are recognized as existant and influential throughout education. It likewise seems prudent to call attention to the probability that no one attitude is a discrete element, but rather a reflection of the characteristics of the whole person.

A careful survey of those items which elicited attitudes which fall in the "very positive" class will demonstrate that all of them satisfy the three basic principles of music education. These phases of the musical experiences of the child keep intact for him the positive emotional value of the music.

They are found as a part of everyday life of the people. The simplicity of the rhythmic and melodic patterns of this music is such that it can be grasped by the child. It should be noted, however, that they are extra-school phases of musical experience.

Those items which elicited attitudes falling in the next highest class, the "positive" class, have, in general, downward trends. They only partially satisfy the three principles of music education. The music of the phonograph, violin and symphony orchestra is often too complex and foreign for children to grasp. Sex differences are very evident in this class in religious music, cowboy songs, seasonal songs and school musical activities. This group lies half-way between those items which fully satisfy the three principles and those items in the next lower class, the "neutral" class.

The items eliciting attitudes falling in class "3," "neutral," violate to a great extent all three principles. Sex differences account for several of the downward trends. The items, for the most part, refer to musical activities having no positive emotional value or connection with the extra-school life of the child. They are nearly all activities peculiar to school music.

Only one elicited attitude falls into the "negative" class. It is fairly obvious that few children like to sing when they are so frightened or embarrassed that there is no pleasure in the singing.

In general it is important to note that those attitudes whose final status is "very positive" are those in which the dominant influence is outside of the school. In other words, extra-school music has been much more affective in the development of positive attitudes toward music than has the music of the school. Music education has often destroyed the appeal of music, whereas the music of everyday life has enhanced the appeal of music. The great similarity of the mean attitude scores and the direction and strength of the trends in each of the ten schools studied demonstrates that there is a very affective, common factor functioning in the development of the attitudes of the 500 subjects.

The first correlation presented in Table IX is an unreliable representation of the relationship between school organization and equipment, and attitude. The reason for such a correlation may be the small number of schools studied, or the fact that good organization and equipment do not insure good teaching and the right use of equipment.

The unreliability of the correlation between teaching method and aim, and attitude is an indication, borne out by the data, that more influential factors are at work in the development of musical attitudes. No strong correlation was expected between intelligence and attitude because the less intelligent child may adopt, ready-made, the same attitude that the more intelligent child develops by insight.

From the reliable and relatively high correlation between attitude and home influence in music it is evident that a good home musical influence and a positive attitude toward music go hand in hand. The highest correlation found between attitude and one of the variables was the correlation between attitude and musical scholarship. It seems natural for a child

to think well of that which he can do successfully, and he undoubtedly will have a better chance of being successful if he likes that which he is doing.

The highest correlations found were those between musical scholarship and intelligence. These very significant relationships justify fully the part that intelligence should play in music education. There is likewise a strong relationship between the home musical influence and musical scholarship. The home of good influence will be zealous for the scholastic success of the child. This relationship would indicate a similar relationship between home musical influences and intelligence, and mental age. The correlations found for these last two relationships bear out the indication.

Conclusions

From the evidence of the data of this study the following general conclusions seem to be justified:

1. A large majority of children have a definite positive attitude toward most of the various phases of their spontaneous musical experience.

2. The movable "Do" method of solfeggio is not an effective means of developing the ability to read music, or of developing desirable attitudes toward music.

3. There is an inverse ratio between grade level and positive attitude toward school music on the part of school children.

4. In terms of attitudes there is no significant difference in the outcomes of music education among the different schools from which the subjects were drawn.

5. The extra-school music experienced by the child is more dominant in the development of positive attitudes toward music than is the music of the school.

6. Methods of music education of elementary school children which break down the positive emotional value of music will bring about a trend toward negative attitudes toward those methods of music education.

7. Musical scholarship is a significant factor in the development of positive attitudes by school children toward music.

8. Intelligence is a significant factor in the musical scholarship of school children.

9. Home musical influence is a significant factor in the development of positive attitudes by school children toward music.

10. There is a significant relationship between home musical influence and the musical scholarship of school children.

Implications of this Study for Music Education

Implications of this study for music education are as follows:

1. The movable "Do" method of solfeggio should be supplanted by an adequate method of teaching music reading.

2. The positive emotional value of music should be kept intact for the child.

3. The school should not isolate its music from the music of extra-school life, but should recognize and take into consideration all of the musical experiences of the child.

4. If the skills and appreciations of music are to be intelligently used, then intelligence should play a part in their acquisition.

5. Individual and sex differences should receive more attention.

6. Any method of music education which seeks to develop positive musical attitudes should take into consideration the home musical influence of the children.

7. The significant relationship between musical scholarship and positive attitudes toward music should be given more consideration by music teachers.

8. Since not only the progress, but the very preservation of music is dependant upon a positive attitude towards music, music educators should study more thoroughly, and deal more wisely with the development of attitudes toward music.

THE CONFLICT BETWEEN THE THEORETICAL AND THE PRACTICAL IN MATHEMATICS AND MATHEMATICS TEACHING

CLAUDE H. BROWN

CONFLICTING VIEWS CONCERNING THE NATURE AND EDUCATIONAL VALUES OF MATHEMATICS

It has long been recognized that popular education is essential to the maintenance of democratic institutions. But it remained for the totalitarian regimes, openly hostile to democracy and democratic ideals, to demonstrate in actual practice how easily popular education may be perverted into an instrument of oppression and intolerance.

To prevent education from becoming an instrument of oppression and make of it an effective agency for attaining the ideals of democracy, it is necessary continually to examine, evaluate, and revise educational methods, materials, and objectives. Social and economic changes occur constantly, creating new educational problems, and, as a consequence, the educational program must be continually revised if it is to meet adequately the needs of a democratic society.

The tendency in recent years to question the educational value of mathematics is an attempt to solve one phase of the complex problem presented by the retention in school of great numbers of young people who lack the intellectual ability, energy, or desire to master the traditional courses in secondary mathematics.

It has been suggested that the curricular revision made necessary by the fact that the traditional curriculum fails to meet the needs of those whom it is expected to serve will involve eliminating all mathematics except that which has vocational use. Immediate utility is to be the criterion for selection of subject matter. The place of mathematics in education is to be determined entirely by its practical applications.

On the other hand, there are those who maintain that mathematics has educational values other than those of vocational usefulness—values which may be described as cultural and disciplinary. They contend that mathematics is first and foremost a mode of thinking and that the possible practical applications of its principles and the relative certainty and permanence which may be ascribed to its conclusions are secondary, not primary, values to be recognized from the study of mathematics.

It is apparent that the real point at issue is not whether mathematics should be included in the curriculum but rather what, and how much mathematics should be included and for whom. It is manifestly impossible for any individual, however gifted, to master the whole field of mathematics. Hence it is evident that any program of mathematics education for all students implies a selection of subject matter, or a prescription of subject matter implies a selection of students if it is to be educationally defensible.

But selection of subject matter and of students are the points at issue in the conflict between the practical and the theoretical in mathematics education. Widely divergent conceptions of the real nature of mathematics give rise to widely divergent views concerning the educative values to be realized from the study of mathematics.

The essential idea of the practical or applied science viewpoint is that the value of a thing is determined by the use made of it. A theory in mathematics is worth while only as it aids in solving specific practical problems. A study is of value in education only as it serves the specific and immediately felt needs of the pupil.

From the theoretical or pure science point of view, a new theory in mathematics is of value in and of itself. It is a work of art, like a painting, a poem or a musical composition. If a practical use be found for this theory, either at the time or later, the added value is only incidental.

Neither point of view gives a sufficiently broad outlook on life to permit the complete exclusion of the other. The problem of determining the place of mathematics in education is precisely that of striking a proper balance between the practical and the theoretical phases of the subject.

The attention of mathematicians has been centered too much on attempts to justify the subject because of its intrinsic value. The practical educator, in attempting to meet the needs of the heterogeneous group that fills his classroom, tends to be more concerned with immediate utility than with remote and intangible benefits.

Mathematics may be regarded as a symbolic language whose practical function is to express quantitative and spatial relationships and whose theoretical function is to facilitate thinking. This conception recognizes and gives due emphasis to both phases of mathematics. It may well serve as the basis for a satisfactory solution of the dispute concerning the place of mathematics in education.

The dispute over the place of mathematics in education appears to have its origin in the conflict between the practical and the theoretical. It is the purpose of this study to investigate the nature and history of this conflict and also its present status insofar as that can be determined from an examination of the manner in which it is treated in educational theories. It is carried on with the aim and in the hope of finding a way out of the present confusion over the place of mathematics in education.

Development of the Present Curriculum in Mathematics:

I. Ancient and Medieval Background

Since the basic mathematical subjects offered in the public schools at present are arithmetic, algebra, and geometry, or various compositions of these, the scope of the present survey will be limited to a consideration of these divisions only of the whole field of mathematics.

The history of occidental mathematics up to the time of the Reformation may well be divided into four periods. In the first period the dominant culture was that of Egypt and Babylonia. The utilitarian values of mathe-

matics alone were recognized and education was confined largely to preparation for the priesthood.

Greece dominated the second period. The Greeks emphasized the theoretical aspects of mathematics and neglected the practical. In marked contrast to the stagnation which resulted from the Egyptian and Babylonian emphasis on the practical, the Grecian era of emphasis on the theoretical was characterized by great progress in mathematics, particularly geometry. Education in Greece was limited to the sons of citizens and was cultural rather than practical.

In the third period, emphasis was on the practical both in mathematics and in education. During the Roman era, despite their great engineering achievements, no notable advance in theoretical mathematics was achieved. The practical Romans, like the idealistic Greeks, failed to devise a usable number system and Roman education proved to be adapted for training unprinicpled political opportunists rather than statesmen.

In so far as progress in mathematics was concerned, the Middle Ages was a continuation of the third period. Emphasis was still on the practical, to the exclusion of the theoretical, and the monastic schools failed to preserve even as much of the spirit of Greek learning as did the Romans. Again, as in early Egypt, education became a matter of training for the priesthood.

The Renaissance ushered in the fourth period; a period when learning was again sought for its own sake. Mathematical developments of immense value were the immediate fruits of the Revival of Learning. The Hindu-Arabic notation, the idea of zero, and that of place value of numbers revolutionized the art of computation. Modern arithmetic and algebra attained a completeness of development comparable to geometry. The Reformation created a need for universal education.

Seemingly, one is forced to conclude that greatest intellectual progress is achieved by consideration of the theoretical. However, since mathematics grew out of human needs, neglect of the practical may lead to theoretical results of little or no value. Then interest wanes and progress ceases. A proper blending of the theoretical and the practical appears to be essential if stagnation is to be avoided.

Development of the Present Curriculum in Mathematics: II. Education in America Before 1820

The primary purpose of colonial colleges was to train clergymen. Hence major emphasis was placed on the study of languages. Mathematics occupied a minor place in the college curriculum and only the theoretical aspect was considered. In the grammar schools mathematics was not a part of the regular curriculum but was taught in an auxiliary school. In the lower schools utilitarian values were stressed. However, the methods of teaching mathematics in colonial schools were such that either aim was effectively realized.

Available evidence seems to indicate that mathematics first came into American secondary school curricula because of its practical utility and not

because it was a prerequisite for college entrance. The Revolutionary period was one of commercial expansion. There was a demand for training in surveying, navigation, and the arithmetic of commerce. As a result, algebra and geometry ceased to be college subjects and were taught in the secondary schools. Arithmetic became an elementary school subject. At the same time such factors as the social prestige of college mathematics and the fact that the teachers were trained in abstract mathematics tended to make the mathematics taught in the academy formalized and abstract. Apparently it was only after competence in arithmetic, and later in algebra and geometry, became so common that it was no longer worthwhile for the colleges to maintain classes in these subjects that elementary mathematics became a prerequisite for college entrance.

Development of the Present Curriculum in Mathematics: III. Mathematics in American Education After 1820

The teaching of mathematics, particularly of arithmetic, was greatly influenced in the period immediately after 1820 by the work of Warren Colburn who, in turn, drew his inspiration from the theories of Pestalozzi. Colburn sought to impart the ability to make reasoned and skillful use of the processes of arithmetic. He envisaged a school in charge of a *teacher* who assisted his pupils to learn, not a *master* who *kept* school and listened to "re-citations" of verbalisms. Instruction in arithmetic was pushed down in the grades until it was taught to beginners and the time devoted to arithmetic was increased until it came to dominate instruction much as reading had done previously. Increasing emphasis was placed on skill and thoroughness in performing calculations.

Unfortunately, the impulse to educational progress which resulted in the development of free public elementary schools, the beginning of the high school movement, and the application of Pestalozzian reforms to the school program was largely spent by 1860. Not only had teaching become formalized, but the aim of mathematics education had also changed. Available evidence seems to indicate that in 1867 mathematics was taught for its disciplinary value; not for its immediate utility. Apparently, the utilitarian subject matter of post-Revolutionary War days had been converted into an instrument for intellectual discipline through a reversal of the process by which the practical Romans adapted the subject matter of the idealistic Greek education to utilitarian aims.

The work of Colburn is evidence of the possibilities for educational progress inherent in an effective synthesis of the two phases of mathematics. It seems apparent that a satisfactory program for mathematics education in the United States must take both phases of the subject into consideration. We turn now to the task of determining to what extent various proposed teaching programs of today meet this requirement.

Mathematics and the Program of the Progressives

The term "Progressives" is taken in this discussion as referring to the members of, and the policies advocated by, the Progressive Education Association.

The Progressive method may be summarized, in so far as it applies to mathematics, by saying that its characteristic method is the project method —it depends upon incidental learning—and uses two different criteria for the choice of subject matter: the immediate interests of the pupil, and utilitarian value.

An entirely different program—a program based on the theoretical phase of mathematics—is provided for students who expect to enter college. Apparently, the mathematics program in the secondary school is to be dualistic in nature. One phase will be based on pupil interests and utilitarian values; the other is a traditional treatment of the theoretical aspects of mathematics which is to be imposed upon those students who are preparing for college.

The first phase—the Progressive part of the program—is formulated upon the assumption that the theoretical phase of mathematics has no educative significance for most children. In other words, the revolt of the "rebels and protestants against the regimentation of the formal school" amounts, for the non-college preparatory course, merely to taking the side of the practical in the age-old quarrel as to whether we should stress the practical or the theoretical.

Furthermore, although there is a real place for the project method in education, it cannot be made to cover the whole field. The universality of application of the project method is seriously questioned, even by some of the Progressives. Stanwood Cobb, founder and early president of the Progressive Education Association, lists as "limitations of activity education" the following: (1) the neglect to assure definite cultural results; (2) the tools and techniques of learning cannot be learned by the project method but can only be motivated by it; (3) lazy, unambitious, and slow children respond better under academic pressure and discipline; (4) retared children above borderline intelligence need thorough drilling in the techniques of reading and arithmetic more than they need activities.[1]

The Progressive program seems to ignore the desirability of enabling pupils to understand life situations of any larger scope than their own individual needs and experiences. The Progressive program fails to give pupils an adequate understanding of the public affairs necessary for the public good in a democracy.

Hence, it seems that the program of the Progressives is inadequate in so far as mathematics is concerned. It is based upon a method of instruction—the project method—which will not admit of universal application. An adequate grasp of mathematical principles cannot be acquired incidentally, as the Progressives advocate. They present a dualistic secondary school program based on the assumption that only those who plan to enter college need be concerned with the theoretical phase of mathematics, and therefore for those students who plan to enter college the Progressive pro-

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[1] Cobb, Stanwood, *New Horizons for the Child*, Washington, D.C., Avalon Press, 1934, p. 115.

gram is essentially traditional. In the program designed for the great majority of students—those who are not expected to enter college—the Progressives neglect the theoretical phase of mathematics entirely, and attempt to justify that neglect by appeals to theories of psychology and learning that are themselves open to serious question.

Hence the program presented by the Progressives fails to resolve the conflict between the practical and the theoretical as it applies to contemporary mathematics education.

Mathematics and the Doctrine of Specific Objectives

The specific-objectives approach to curriculum construction is a logical consequence of Thorndike's identical elements theory of transfer. According to Thorndike, transfer of training from one situation to another takes place when, only when, and to the extent that the two situations involve identical elements. Therefore, in order to be effective the objectives of an educational program must be specific, not general.

The work of Bobbitt has been selected as typical of the specific-objectives approach to curriculum construction, that of Morrison as typical of general method, and Breslich's as typical of the application of Morrison's theories to mathematics education. Carleton Washburne has applied the doctrine of specific objectives to elementary education.

The doctrine of specific objectives is based upon the assumptions that (1) the aim of education is preparation for adult life; (2) transfer is dependent upon the presence of identical elements; and (3) mathematics is the science of number, quantity, and measurement. The doctrine of specific objectives emphasizes the practical and neglects the theoretical phases of mathematics. Because it depends on analysis of the present activities of adults to determine the subject matter of the curriculum, the specific-objectives theory fails to provide for changing conditions. Because it postulates a static society and makes no provision for progress, it is not democratic education.

Because the doctrine of specific objectives is based on the assumption that the ultimate aim of education is preparation for adult life, the basic method of curriculum construction employed is activity analysis. The typical teaching methods are based on the idea of teaching effectively a subject matter predetermined by analysis of the activities of adults.

The specific objectives program for mathematics education is based on the same conception of transfer and the same assumption concerning the nature and educative values of mathematics as is the program proposed by the Progressives. The identical elements theory of transfer accepted by both groups has been largely discredited and the narrow utilitarian conception of mathematics basic to both programs entirely neglects the educational values that may be derived from the study of theoretical mathematics.

Hence, like Progressive theory, the doctrine of specific objectives fails to solve the problem presented by the conflict between the practical and the theoretical in mathematics education. The specific objectives group, instead of seeking to harmonize the conflicting points of view, enters into

the controversy on the side of those who advocate teaching only the practical phase of mathematics. The doctrine of specific objectives, therefore, has served to increase rather than diminish the confusion regarding the place of mathematics in education.

Mathematics in the Essentialist Program

The Essentialist program takes its name from the group of conservative educators who, in 1938, formed the Essentialist Committee for the Advancement of American Education. Dr. William Chandler Bagley has been prominently identified with the movement from its inception and, in the discussion which follows, his views will be taken as representative of the Essentialist point of view.

The immediate inspiration of the Essentialist movement was dissatisfaction with the policies of the Progressive Education Association. Bagley says that American students compare unfavorably in scholastic achievement with students of the same age and grade placement in foreign countries.[2] He ascribes the unsatisfactory results produced by American educational procedures to lowered scholastic standards and enfeebling educational theories—theories inherent, so Bagley says, in the doctrines of the Progressive Education Association. However, the Essentialist platform as presented by Bagley is more than a protest; it is a constructive expression of an educational philosophy.

The Essentialist program is based upon the philosophy that education is discipline and, as such, it is the antithesis of the Progreesive program. The Essentialists consider mathematics to be a postulational science which derives its educational value from its theoretical rather than its practical aspects. The Essentialists accept as a working principle the idea that transfer of training is possible, and advance the theory that ideals developed in one situation transfer to others in the form of applied standards of conduct. They have not formulated a definite criterion for choice of subject matter, and the method of teaching is definitely authoritarian in nature. Their program is based upon a confused and unnecessarily complex conception of the learning process; a conception which represents a seemingly unsuccessful attempt to blend two contradictory theories without providing for harmonization of the conflicts. Apparently, for the Essentialists, the aim of education is preservation of the "status quo" in society.

Perhaps the fairest way to summarize the views of Bagley—and Bagley speaks for the Essentialists—would be to say that although he does not deny the possibilities, and even the need, for improvement in present day educational theories and practices, he still believes that none of the innovations yet proposed is any better, and some are definitely worse, than the traditional plan. He is concerned lest, in attempts to eliminate defects in the present program, items of proven worth will be lost.

Bagley has called attention to many weaknesses in the Progressive program and has done so quite effectively. He has rendered real service in call-

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[2] Bagley, W. C., "An Essentialist's Platform for the Advancement of American Education," *Educational Administration and Supervision*, 24:241-256, April, 1938.

ing attention to the need of employing the disciplinary function of education. But it is necessary to do more than point out weaknesses of the Progressive program and virtues of the traditional school. The Essentialists have been so intent on calling attention to factors neglected by the Progressives that they have failed to note the incongruities in their own program.

In the conflict over the place of mathematics in education, the Essentialists have merely taken the side of those who would place major emphasis on the theoretical phase of the subject. More than that, they apparently assume that the principal educational value of mathematics is derived from the fact that, for many students, it is difficult. Hence, Bagley's proposals, like those of the Proegrssives and the specific-objectives groups, have increased, rather than decreased the confusion over the place of mathematics in education.

The Program of the Subject-Matter Specialists

Two points of view from which the dispute over the place of mathematics in a program of education may be studied are: (1) that of the subject-matter specialist whose major interest is mathematics, and (2) that of the general educationalist who is interested in mathematics only as it contributes to the general aims of education.

The Preliminary Report[3] of the Joint Commission of the Mathematical Association of America and the National Council of Teachers of Mathematics represents an attempt on the part of teachers of mathematics to determine what changes in content and method are necessary if mathematics is to make its maximum contribution to education. This Report, therefore, will be taken as representative of the views of the specialist in mathematics.

The Commission believes that, in the final analysis, the teaching methods employed are of greater importance in determining the educative values to be derived from the study of mathematics than is the choice of particular bits of subject matter. The Commission has not attempted an impartial determination of the place of mathematics in secondary education. It starts with the assumption that there are unique educational outcomes to be realized from the study of mathematics. It takes the view that although the utilitarian phase of mathematics is important, the theoretical phase is of equal or greater importance. The Commission considers the Progressive program—based on the project method, incidental learning, and a narrow, utilitarian conception of mathematics—as inadequate, and it has sought to formulate a teaching program which will be free from the objections urged against the traditional curriculum in mathematics and at the same time retain as much of its subject matter, methods, and objectives as can be shown to have educative value. In direct contrast to the Progressives, the Commission would increase rather than decrease curricular offerings in mathematics.

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[3] This Report has since been published in its final form as the Fifteenth Yearbook of the National Council of Teachers of Mathematics.

Possibly one weakness in the Commission's program arises from the fact that the program outlined is so flexible, and therefore indefinite, that it may be used to justify continuation of mathematical instruction of the most traditional type. The traditional curriculum in mathematics, if effectively taught, provides a satisfactory foundation for advanced mathematical studies and, therefore, teachers of mathematics tend to be apathetic toward changes for which they see no real need. This natural reluctance to change is intensified by the relative permanence of mathematical concepts.

The educational philosophy of the Commission can best be described as eclectic. It has attempted, in formulating the program presented in the Report, to take into account such widely divergent points of view as that of the Progressives on the one hand and the Essentialists on the other. Apparently the Commission takes utility as its criterion for choice of subject matter but favors a liberal interpretation of the term which permits inclusion of material for its interpretative and esthetic values. The method of incidental learning, favored by the Progressives, is definitely rejected with no other teaching method definitely recommended.

The Report of the Joint Commission suggests much that needs to be done to modernize the mathematics curriculum; and, in the degree to which it has explored the possibilities of resolving the conflict between the practical and the theoretical by curriculum revision alone, the Commission has made a valuable contribution to the solution of the place of mathematics in secondary education.

However, the Commission has not suggested a basis for harmonization of the conflict between the practical and the theoretical as it applies to the teaching of mathematics. Instead, it has attempted to effect a compromise between the contending factions. Harmonization of this basic conflict, as Dewey suggests, requires "a plan of operations proceeding from a level deeper and more inclusive than is represented by the practices and ideas of the contending parties." The Commission does not present such a plan.

Nor has the Commission suggested any plan for the progressive refinement of its program. It is not enough to bring the curriculum up to date. Any acceptable program for democratic education should provide a means of keeping it there.

In other words, curriculum revision alone is not sufficient to resolve the conflict between the practical and the theoretical as it applies to the teaching of mathematics.

The Dewey-Bode Plan As a Means of Resolving the Conflict Between Practical and Theoretical

Thus far our study has failed to disclose an educational program which gives promise of being effectual in settling the age-old conflict between the practical and the theoretical in mathematics teaching. Yet such a program is sorely needed, for although we recognize the need for both characteristics we also realize that when they are conflicting they can do little except generate friction resulting in loss of vital energy.

An outstanding feature of the educational discussions of John Dewey is his persistent treatment of issues in conflict and his search for means by which the conflicts can be composed. Dewey does not consider it necessary to compromise the points in dispute between two opposed schools of thought nor does he favor a compilation of points taken at random from the various schools of thought. He believes that harmonization of conflicts can best be attained by introducing "a new order of conceptions leading to new modes of practice."

The first step in harmonizing the conflict between practical and theoretical is to determine the function of the practical (the useful) and the theoretical (the cultural and abstract) in education and in life.

The practical gives rise to problems in theory. That is, by a process of abstraction, the elements in a given experience which have universal application are detached from those which have purely practical application. The theoretical, arising via abstraction, enables practice to become aware of and master over itself. That is, by the process of abstraction and the use of terms to record what is abstracted, the net value of individual experience is put at the permanent disposal of mankind.

Furthermore, the practical serves as the basis for testing theory. A theory must be applied, either actually or in the imagination, in a concrete situation before we have have real knowledge and understanding of what it means. The test of a theory is to see if it works in particular cases.

But, theories come into being as the result of abstracting the common element from a number of particular cases. Therefore the theoretical serves to explain what happens in a particular case and is itself tested by application to concrete situations. In other words, the universal makes the particular intelligible and the particular makes the universal workable.

The process of abstracting the universal from the particular is a reflective process and it is through reflection that conscious application of theory to concrete situations is made possible. *Therefore, the conflict between practical and theoretical is harmonized if education is viewed as a reflective process which begins with profusion and confusion of particulars and proceeds toward the formulation of clarifying and simplifying universals.*

Let us see what the Dewey view of the relationship between practical and theoretical means in terms of an educational program which will harmonize theory and practice.

The first factor to be considered in formulating an educational program is the type of social organization to be served by that program. The type of social organization most in keeping with the American tradition and with the ideals of the American people is that implied by the term *democracy*. Democracy, as Dewey says, "is more than a form of government; it is primarily a mode of associated living," and must be regarded as an ideal in process of realization rather than an accomplished fact. Democracy implies not only equality of freedom but equality of responsibility as well, and if competence to share in the one is limited there must be a proportionate limitation of sharing in the other. Citizenship in a democracy, therefore,

implies competence on the part of the individual to assume responsibility in crucial matters and in situations that are novel to him. But an individual will encounter novel situations only if life—his world as he knows it—undergoes change and therefore brings in that which is new. In a changing world an individual is constantly confronted with problems and confusions for which he must find solutions; his outlook on the world must be in a continual state of reconstruction which looks toward the improvement of that outlook.

Moreover, democratic education must seek to train individuals not only to solve problems but also to identify them. Problems do not arise already labeled; a significant phase of the competence of a competent thinker is to be able to recognize that which requires thought and that which does not.

We assume that improvement in an individual's outlook on life implies (1) an increase in the number and scope of factors covered by that outlook (*enhancement*), and (2) an increase in the degree to which such factors are brought into agreement with one another (*harmonization*). Such an assumption means that areas in which improvement is required—therefore areas which involve problems—are (1) those which represent inadequate coverage of pertinent or influential factors (*inadequacies*), and (2) those which represent factors which are, or at least appear to be, out of keeping with one another (*conflicts*). Therefore, as a covering-end for education, we would seek "*to stimulate a student toward becoming an independent learner while at the same time he is developing an enhanced and more harmonic outlook on life.*"[4]

In a program of democratic education, therefore, the acquisition of knowledge—gaining a mastery of subject matter—is considered only as a means to the end of progressive reconstruction and reorganization of experience—outlook. Improvement of outlook is to be a reflective process and reflection is also the process by which an individual becomes an independent learner. Recognition of the place of reflection in the educative process is a distinguishing characteristic of the Dewey-Bode plan.

Dewey does not say that we learn by doing. He says that "thinking is the method of an educative experience." Doing may come into the educative process but, if an individual can learn without doing he should do so because time and effort are thereby saved. Books are of value in education because they promote learning without doing. It is true that a problem may be recognized as the result of activity and that further activity may be required in solving it, but the educative value of the experience is derived from the insight it gives into the methods of solving problems and not from the activity just as activity.

The Dewey-Bode plan implies the goal-insight theory of learning—the idea that learning is a process of developing insight. Insight means a comprehension of the relationships existing between the goal and its mode of achievement.

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[4] Bayles, E. E., "A Philosophy for Science Teaching," *School Science and Mathematics*, 39:805-811, Dec. 1939.

Transfer of training, according to the goal-insight theory of learning, occurs when the learner recognizes that principles and ideals developed in one situation are applicable in another. Therefore, training which will transfer is training received through reflective study because it is through reflection that opportunities for transfer of training are discovered and conscious application of theory to concrete situations made possible. In other words, *reflection is the process of harmonizing practical and theoretical.* Hence we arrive at a conclusion of tremendous importance. *Training in reflective thinking represents training in seeing opportunities for applying the knowledge which a learner has acquired.* In the case of mathematics this implies that the school must be concerned both with developing competence in problem-solving techniques through the study of mathematics and with developing ability to recognize possibilities for application of these problem-solving techniques to life situations. In other words, mathematics teachers must "teach for transfer."

The Dewey-Bode program for democratic education can be summarized as follows: Learning is viewed as a process of gaining new insights. Reflective thinking is the method of an educative experience. The subject matter of education is life. The aim of education is development in the individual of a competent outlook on life. An individual is competent to cope with life to the degree that his knowledge of his world is adequate, pertinent, and harmonic. An educational program can aid an individual to develop a competent outlook on life only by stimulating him to become an independent learner, one who is able to recognize inadequacies and inconsistencies in his environment and who knows how to attack the problem of resolving the conflicts so discovered. This implies that he must be able to think reflectively.

Therefore, a program of education for a democratic society based on the Dewey-Bode plan will be concerned with developing in the individual the ability to do reflective thinking. To the extent that it is able to develop this ability, such a program will succeed in resolving the conflict between the practical and the theoretical.

What is the place of mathematics in such a program? In the first place, the educative values of a subject such as mathematics represent, not values inherent in the subject itself, but possibilities to be realized through effective teaching of that subject. Therefore, an individual needs to study mathematics, not primarily to learn mathematics, but because he becomes, through the study of mathematics, more competent to cope with life.

Secondly, no attempt need be made to distinguish between educative values derived from the study of practical mathematics and those gained from theoretical mathematics. Because cultural, disciplinary, or practical values are not qualities inherent in the subject matter, we may regard these values as goals for the teaching of mathematics. Discipline may be considered to be training in generalized techniques of problem solving. This includes the old idea of discipline (volitional maturity sufficient to force oneself to do disagreeable things) in the sense that one develops an insight into the fact that, even though a task is difficult, it can be accomplished

and is worth doing. The study of mathematics, therefore, may have disciplinary values.

Thirdly, before disciplinary values can be realized from the study of mathematics, the learner must recognize that mathematics is worthwhile—that the techniques learned in one situation will transfer to other situations. That is, mathematics must be taught in a way which will emphasize the possibilities of transfer. Furthermore, we have seen that reflection is the process by which opportunities for application of theory to concrete situations—for transfer—are discovered. Therefore, the Dewey-Bode plan implies, not a radical change in the subject matter content of mathematics education, but broadening of the scope and development of teaching which will be effective in stimulating reflection-level thinking.

How can reflection-level thinking be promoted? Teaching will promote reflection-level thinking if it is problem-teaching. "Pupils have to be brought face to face with problems which challenge them: with I-don't-know situations about which they are really concerned."[5] The work of Ulmer and of Fawcett may be cited as typifying problem-teaching as applied to high school geometry.[6] They place the emphasis in teaching geometry upon developing ability to do reflective thinking about the problems of life rather than on proving theorems. It seems reasonable to assume that geometry, so taught, will aid the individual to develop a competent outlook on life.

In algebra, aside from the text by Mitchell and Walker[7], little has been done toward developing teaching methods which promote reflective thinking. There is good reason to believe that problem teaching techniques will prove as effective in teaching algebra as geometry.

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[5] Bayles, E. E., "The Relativity Principle As Applied To Teaching," *The University of Kansas Bulletin of Education*, 4:9, February, 1940.

[6] For detailed descriptions of the methods used, see: Fawcett, H. P., *The Thirteenth Yearbook of The National Council of Teachers of Mathematics*, New York, Bureau of Publications, Teachers College, Columbia University, 1939. See also: Ulmer, Gilbert, *Teaching Geometry To Cultivate Reflective Thinking; An Experimental Study With 1239 High School Students*, an unpublished doctoral study made at the University of Kansas, 1939. Summarized in University of Kansas Bulletin of Education, Vol. IV, No. 4, February, 1940, pp. 47-56.

[7] Mitchell, U. G., and Walker, Helen M., *Algebra, A Way Of Thinking*, New York, Harcourt Brace and Co., 1936.

Editor's Note: Dr. Brown's study included an illustrative unit in the study of algebra which had to be omitted because of limitations of space.